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SOIL SURVEY OF MADISON COUNTY, ALABAMA

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United States Department of Agriculture in cooperation with the Alabama Department of Agriculture and Industries, the Alabama Agricultural Experiment Station, and the Tennessee Valley Authority

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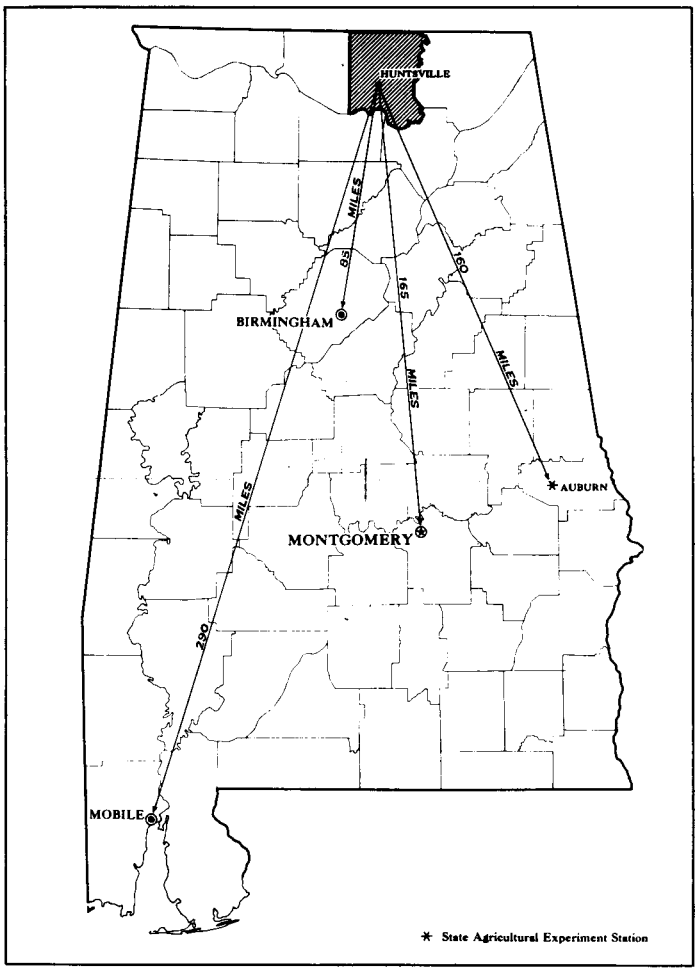


Figure 1.—**Location of Madison County in Alabama.**

and Kentucky. Madison County was formed in 1808. In 1930 its population was 64,623, and the population had increased to 72,903 by 1950. Huntsville, the county seat, is approximately 85 miles north of Birmingham. Huntsville had a population of 16,437 in 1950.

Industries and manufacturing

Stoves, agricultural implements, and shoes are made in the Huntsville area, and cotton mills are located there. Woodworking mills in and around the city manufacture articles from forest products, and portable sawmills are common in forested areas throughout the county. Two Federal arsenals, which at peak production during World War II employed approximately 11,000 people, are located on two large tracts south of Huntsville.

Coal is mined on a small scale in the mountainous sections of the county. Limestone is taken from a few quarries in these areas and is usually made into lime for agricultural use. Gravel is dredged commercially from the Tennessee River.

Transportation

The main line of the Southern Railway connecting Memphis and Chattanooga, Tenn., passes through Huntsville. A branch line of the Nashville, Chattanooga, and St. Louis Railroad connects Huntsville with its main line at Decherd, Tenn.

Good roads, many of which are hard surfaced, make all of the county except some of the mountain areas easily accessible to cars and trucks. As a result, the churches and consolidated schools are reasonably easy to reach from all parts of the county.

A 9-foot channel is maintained on the Tennessee River for shipping. Port facilities are provided at Decatur, Ala., 39 miles southwest of Huntsville.

Physiography, drainage, and geology

Physiography

The main physiographic areas of the county are a remnant of the Cumberland Plateau in the eastern third of the county, and the smooth plain that is part of the eastern Highland Rim of the Interior Low Plateau (*2*)[2] (fig. 2). In Alabama this smooth plain includes the gray lands and red lands of the Tennessee Valley.

The Cumberland Plateau.—This area consists of the steep western facing scarp of the Cumberland Plateau and outlying remnants that are predominantly steep to very steep stony slopes. Small remnants of the smooth plateau occur on the crest of these outliers and on the plateau proper along the eastern county line. Hartsells, Muskingum, and Rockland, limestone, soils are predominant in this mountainous country.

The Highland Rim.—The relief of this area is predominantly undulating to rolling. The Highland Rim lies approximately a thousand feet lower than the crest of the Cumberland Plateau ridges. It has two subdivisions: (1) The gray lands, which consist of yellowish cherty residuum from cherty limestone, and (2) the red lands, which consist of reddish residuum from high-grade limestone and a variable amount of old general alluvium that has been widely distributed.

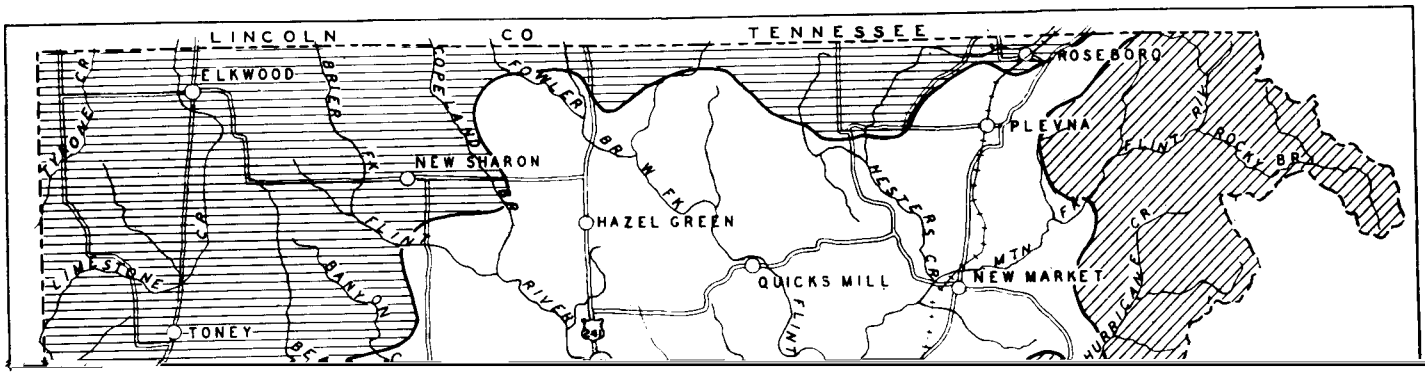
The gray-lands area is mainly in the northwestern part of the county. It consists predominantly of undulating and rolling Dickson and Baxter soils. The red lands occupy a broad undulating and rolling belt that extends southwestward from the Alabama-Tennessee line in the vicinity of Plevna to the extreme southwestern corner of the county, including Madison and Triana. Cumberland and Decatur soils are predominant in much of this landscape.

Old general alluvium.—This material occupies a large part of the lower areas of the Tennessee River Valley. The most extensive of these old general alluvial areas lie in the southeastern part of the county. Throughout much of the red lands or central part of the county, however, areas of old alluvium or colluvium occur that are difficult to distinguish from the associated red soils developed from limestone residuum in place. Fairly large areas of young alluvium occupy belts along the larger streams; they comprise the first bottoms. The largest areas occur along the Tennessee River. Most of this young alluvium consists of a mixture of sediments derived from limestone, sandstone, and shale. A considerable area of young alluvium was permanently inundated by the Wheeler Reservoir.

Drainage

The county is drained by the Tennessee River. The surface drainage system is roughly dendritic. Except on

[2] Italic numbers in parentheses refer to Literature Cited, p. 93.


LINCOLN
CO
TENNESSEE
ELKWOOD
BRIER CR
FOWLER BR
ROSEBORO
PLEVNA
NEW SHARON
HAZEL GREEN
W FK
WESTERS CR
FLINT ROCK BR
FK
MTN
CR
BANEY CR
TONEY
RIVER
QUICKS MILL
NEW MARKET
HURRICANE
FLINT
24

the smoother general alluvial plains in the southeastern part of the county and in places in the red-lands belt, this drainage system is fairly well established.

Wade Mountain. It consists of medium-grained sandstone and gives rise to Pearman and Hartsells soils.

Bangor limestone.—This formation, which lies above the

night and occasionally remain below freezing for 1 to 3 days or longer.

Normal monthly, seasonal, and annual temperature and precipitation data are given in table 1. These data are compiled from records at the United States Weather Bureau station at Madison.

Both temperatures and precipitation at Madison are typical of those in the main part of the farming area. The growing season there averages 208 days; on the average the last frost in the spring is no later than April 5, although there have been frosts as late as May 2. In the fall the average first frost is October 21, although frost

the summer, but extensive floods are infrequent. Snow occurs occasionally but seldom remains long on the ground. Occasionally, however, the snow remains for several days.

Normally temperature and precipitation are favorable for producing and harvesting crops. Below normal temperatures, however, and either too little or too much moisture in the spring, sometimes are detrimental to crops. A late spring delays the maturing of cotton and favors boll weevil infestation. Fruit crops, especially peaches, are sometimes severely damaged by late spring frosts.

Although prolonged droughts are rare, excessive dry

out the county except in the mountain section. The largest acreage and probably the highest yields are in the red-lands sections. Acreages of cotton and of the other principal crops grown in Madison County are shown in table 2.

Much of the corn is raised for livestock feed, but it is used also for human consumption. Grain sorghum, grown for livestock feed, has become an important crop, and soybeans are grown extensively. The fall-sown small grains consist principally of wheat and oats. Lespedeza has been the principal hay crop, but other legumes, chiefly alfalfa, have proved to be more desirable and are increasing in acreage. Crimson clover, grown for seed as well as for winter cover, is of great importance throughout most of the county. Lespedeza and vetch for seed are grown on a fairly large acreage.

Land in pasture in Madison County in 1949 totaled 84,056 acres. The quality of pasture has improved in recent years. Winter legumes also have been used

TABLE 3.—*Number of livestock on farms in Madison County, Ala., for stated years*

Kind	1920	1930	1940	1950
Horses	5, 122	2, 455	[1] 2, 317	1, 288
Mules	9, 283	11, 479	[1] 9, 032	4, 341
Cattle	19, 493	14, 107	[1] 15, 425	21, 341
Swine	27, 308	12, 675	[2] 16, 415	27, 104
Sheep	525	808	[3] 594	2, 956
Goats	1, 509	1, 418	[2] 1, 096	([4])
Poultry (chickens)	185, 200	[1] 140,143	[2] 143,080	[2] 145,591

[1] Over 3 months old.
[2] Over 4 months old.
[3] Over 6 months old.
[4] Figure not available.

sold alive, and about 275 were butchered on farms. There are a few large dairy herds in the county, but many of the milk cows are in small herds or on farms that have only

Consistence, or the tendency of the soil to crumble or to stick together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation.

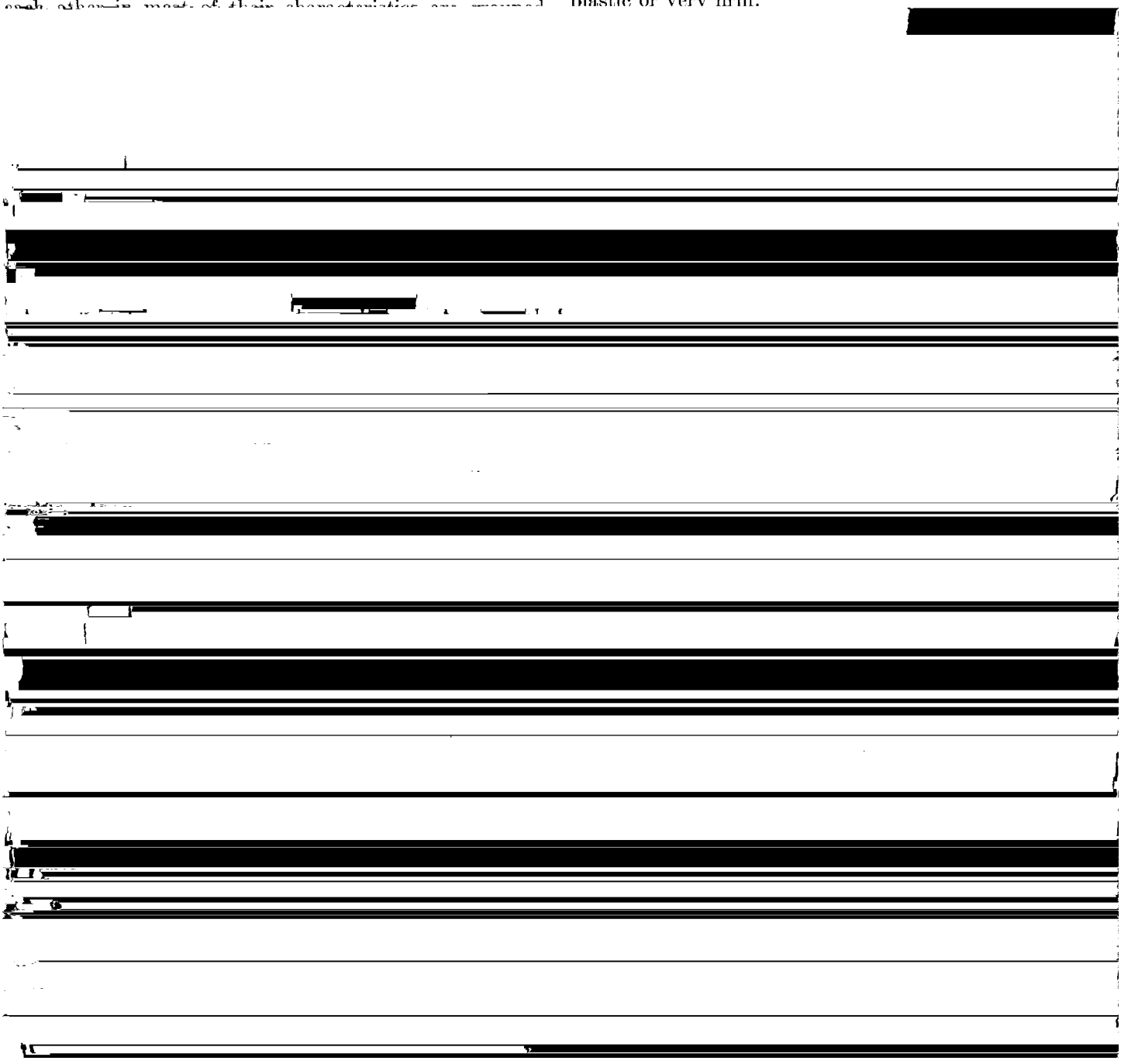
Other characteristics observed in the course of the field study and considered in classifying the soil include the following: The depth of the soil over bedrock or compact layers; the presence of gravel or stones in amounts that will interfere with cultivation; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying rocks or other parent material from which the soil has developed; and acidity or alkalinity of the soil as measured by chemical tests.

Classification.—On the basis of the characteristics observed by the survey team or determined by laboratory tests, soils are classified into phases, types, and series. The soil type is the basic classification unit. A soil type may consist of several phases. Types that resemble each other in most of their characteristics are grouped

these characteristics affect the productivity and the ease with which the soils can be worked and conserved. Accordingly, they affect the agricultural use to which the soils are suited and the requirements for proper management.

Color.—The soils range in color from nearly white to gray or yellow, and from brown to red. Colors intermediate between brown and gray are predominant in the surface soils, whereas red and yellow are predominant in the subsoils.

Texture and consistence.—In great part, the soils are cherty silt loams, silt loams, and silty clay loams. In general they are mellow and friable except where erosion has removed a large part of the original surface soil. The subsoils are mainly silty clay loams and silty clays, but on a small acreage the subsoils are sandier. The consistence of the subsoils ranges from friable to strongly plastic or very firm.



in small areas in the gray lands and on the alluvial plains.

Excessively drained soils make up approximately 19 percent of the total acreage. Moisture drains from these soils within a short time, and they are left without enough water for plant needs. Most of the excessively drained soils have a shallow depth to bedrock and a strong slope and occur on mountain slopes. Nevertheless, one nearly level soil, Bruno loamy fine sand, has excessive drainage because of its extremely sandy texture. It has a small acreage.

Stoniness.—Soils that are free from stones occupy about 64 percent of the county. Their most extensive acreage is in the red lands and on the alluvial plains, but more limited areas occupy positions on the undulating and rolling mountaintops. Approximately 17 percent of the area of the county is covered by soils that contain enough stones to interfere with tillage but not to prevent it. The cherty soils in the gray-lands section of the county make [illegible] considerable part of the stony soils. More limited areas

Soil series and their relations

To make full use of this soil survey, it is necessary to know the soils and to understand how they are related to each other. On the basis of differences in their characteristics, the soils of Madison County have been classified into 48 series and several miscellaneous land types.

The relationship of the soils is more easily understood if they are grouped according to their position on the landscape. Table 4 groups the soil series according to position and shows parent rock and predominant drainage for each.

Table 5 has been provided for soil scientists interested in the morphology and genesis of soils. It groups the soils according to order, great soil groups, and series. For each series it gives the three factors of soil formation most responsible for differences among the series—relief, parent material, and degree of horizon differentiation that has taken place through time. Inasmuch as climate and

TABLE 4. *Soil series of Madison County, Ala., grouped according to topographic position, and the parent rock and predominant drainage of each*

Position and parent rock	Excessively drained [1]	Well drained [2]	Moderately well drained [3]	Somewhat poorly drained [4]	Poorly drained [5]
Soils on uplands:					
High-grade limestone and old valley fill.		Decatur			
High-grade limestone		Dewey			
Cherty limestone		Baxter, Cookeville	Dickson (cherty), Dickson (chert free).	Lawrence	Guthrie.
Very cherty limestone	Bodine				
Clayey (argillaceous) limestone		Talbott			
Very clayey (argillaceous) limestone.			Colbert	Dowellton	
Sandstone (some shale)	Muskingum	Hartsells, Linker			
Sandstone, shale, and limestone			Pearman		
Soils on stream terraces (old general alluvium):					
Chiefly limestone, some shale and sandstone.		Cumberland, Etowah	Capshaw, Captina, Wolftever	Taft	Robertsville.
Chiefly cherty limestone		Humphreys			
Chiefly clayey limestone; in places some shale.				Tupelo	
Sandstone and shale, some limestone.			Holston	Monongahela	Tyler.
Chiefly sandstone, some shale and limestone.		Sequatchie			
Soils on old colluvial land (old local alluvium):					
Chiefly limestone		Hermitage			
Limestone, predominantly cherty		Hermitage (cherty)			
Clayey limestone				Hollywood	
Sandstone and shale, some limestone.		Allen, Jefferson			
Soils on young colluvial land [6] (young local alluvium):					
High-grade limestone		Abernathy		Ooltewah [7]	Guthrie.
Cherty limestone		Greendale		Ooltewah [7]	Guthrie.
Sandstone, some shale					Lickdale. [8]
Soils on bottom lands [6] (young general alluvium):					
High-grade limestone		Huntington	Egam	Lindside [7]	Melvin.
Cherty limestone		Ennis		Lobelville [7]	Lee.
Clayey limestone					Dunning.
Sandstone, shale, and limestone				Hamblen [7]	Prader.
Chiefly sandstone, some shale and limestone.	Bruno				

[1] Indistinct profile caused by rapid geologic erosion or by lack of clay and silt; surface drainage rapid to very rapid; color varies with parent material.

[2] Red to yellowish-brown subsoils, free of mottling to a depth of about 30 inches.

[3] Yellow to yellowish-brown subsoils, mottled at a depth of about 24 inches.

[4] Pale yellow, mottled or gray below a depth of about 6 inches.

[5] Light brownish gray to light gray, more or less mottled throughout.

[6] These soils do not have distinct textural horizons mainly because of the short time their parent materials have been in place.

[7] These soils mapped as somewhat poorly drained to moderately well drained.

[8] Parts are upland, the soil here having been developed in place from the parent rock.

Soils on stream terraces (old general alluvium)

The rivers and streams flowed at considerably higher levels in the past, and at these levels they deposited gravel, sand, and clay on their flood plains. The channels were gradually deepened by stream cutting. New flood plains were formed at lower levels, but remnants of the older high-lying flood plains remained. Most of these areas are now above the overflow stage of the present streams, and they constitute the stream terraces or terrace land. They are frequently called second bottoms or benches. The soils on these stream terraces are distinguished from those on the first bottoms chiefly by greater age and by more mature profiles; that is, they have more distinct surface-soil and subsoil layers.

The greatest differences among the soils on stream terraces are related to differences in internal drainage. Some differences, however, are related to the parent material or parent rock from which the material originated. The Cumberland, Etowah, Humphreys, and Sequatchie soils are well drained and in general are free of mottling to a depth of more than 30 inches. The Cumberland and Etowah soils consist of materials derived largely from limestone, but smaller admixtures of materials from sandstones and shales are included. The Humphreys soils were derived predominantly from cherty limestone. They are lighter colored—the surface layers are grayer and the subsoil more yellow than those of the Cumberland and Etowah soils. The Sequatchie soils are predominantly sandy. They consist largely of material derived from sandstone.

The Capshaw, Captina, Wolftever, and Holston soils are moderately well drained. Their surface layers are predominantly pale yellow to light yellowish brown, and

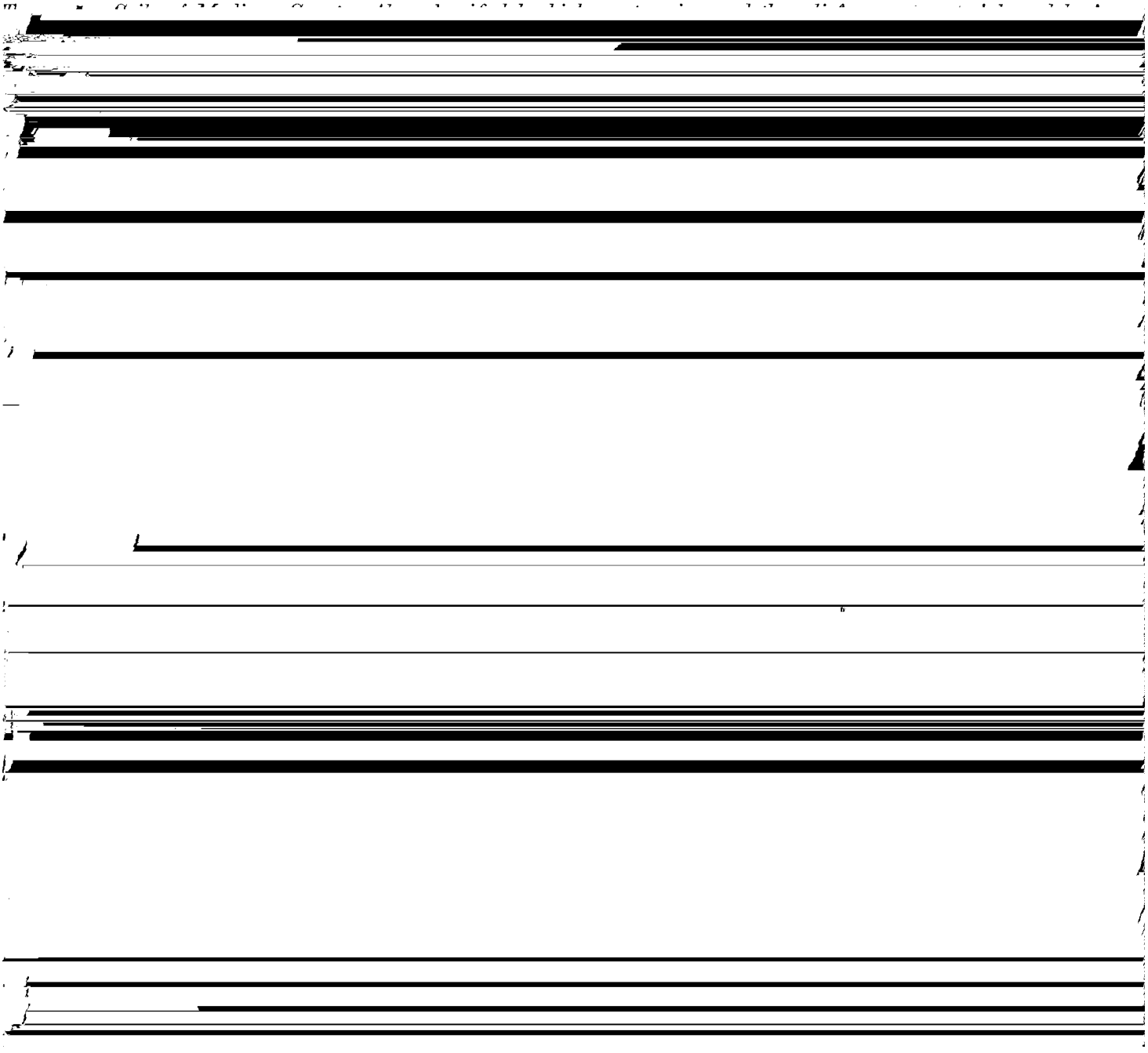


TABLE 5.—*Soils of Madison County, Ala., classified by higher categories, and the relief, parent material, and horizon differentiation for each*—Continued

AZONAL

Great soil group and series [1]	Relief	Parent material	Degree of horizon differentiation
Lithosols:[6]			
		Residuum from weathering of—	
Bodine	Rolling to steep	Very cherty limestone	Low.
Muskingum	Hilly to steep	Sandstone, some shale	Low.
Dowellton	Nearly level to undulating	Argillaceous limestone	Low.
Colbert [7]	Nearly level to rolling	Argillaceous limestone	Low to medium.
		Local alluvium consisting of material derived from—	
Alluvial soils:[8]			
Abernathy	Nearly level to gently sloping	High-grade limestone	Very low.
Greendale	Same	Cherty limestone	Low.
Ooltewah	Nearly level	Limestone	Low.
Guthrie [4] [9]	Nearly level	Limestone	Low to high.
Lickdale [4]	Nearly level to gently sloping	Sandstone, some shale [10]	High.
		General alluvium consisting of material derived from—	
Huntington	Nearly level	Limestone	Very low.
Egam	Nearly level	Limestone	Very low.
Lindside	Nearly level	Limestone	Low.
Melvin [4]	Nearly level	Limestone	Low.
Ennis	Nearly level	Cherty limestone	Very low.
Lobelville	Nearly level	Cherty limestone	Low.
Lee	Nearly level	Cherty limestone	Low.
Dunning [11]	Nearly level	Argillaceous limestone	Low.
Hamblen	Nearly level	Sandstone, shale, and limestone	Low.
Prader [4]	Nearly level	Same	Low.
Bruno	Gently undulating	Chiefly sandstone	Low.

[1] For a discussion of natural classification, description of higher categories, and genesis of series, see soil survey reports for Limestone County or Jackson County, Ala., and the 1938 Yearbook of Agriculture (*6*).

[2] Mottled subsoil. Red-Yellow Podzolic grading toward Planosol.

[3] Partly colluvium, partly residuum.

[4] Gley layer present.

[5] Weak Planosol grading toward Red-Yellow Podzolic.

[6] The following six miscellaneous land types also classify as Lithosols: Rockland, limestone, steep; Rockland, limestone, hilly; Rockland, limestone, rolling; Stony rolling land, Talbott and Colbert soil material; Stony smooth land, Talbott and Colbert soil material; and Stony steep land, Muskingum soil material.

[7] The smoother parts grade toward Red-Yellow Podzolic.

[8] Stony colluvium, Jefferson and Colbert soil materials, also classifies as Alluvial.

[9] In this county, the Guthrie series includes both intrazonal and azonal profiles.

[10] Portions of the Lickdale soil classify as a weak Planosol with gley layer and consist of sandstone residuum.

[11] Dark surface soil and gley layer.

their subsoils are predominantly yellowish brown to a depth of about 22 inches. Below this depth the material is mottled. The Capshaw and Captina soils are permeable throughout the surface soils and subsoils. Their subsoils are friable to firm. The Captina soils have a brittle pan layer below the subsoil at a depth of about 22 inches; the Capshaw soils do not have this pan but the soil is mottled and less compact below a depth of about 22 inches. The Wolftever silt loams have compact or very firm subsoils. The Holston fine sandy loams are distinguished from the Capshaw soils by somewhat better drainage and more sandiness. They consist largely of material derived from sandstone and shale, whereas the Capshaw soils consist largely of material originating from limestone.

The Taft, Tupelo, and Monongahela soils are somewhat poorly drained. The subsoils have a pale or weak yellowish color and are usually mottled to within 6 or 8 inches of the surface. In places the surface soil is mottled. Taft silt loam consists largely of material derived from limestone. Its plow layer is permeable to moisture and roots, and its subsoil is slowly permeable. Tupelo silt loam soils consist mainly of material derived from clayey, or argillaceous, limestone. Accordingly, they have a very firm clayey subsoil. Monongahela fine sandy loam consists largely of materials derived from sandstone and shale, but some material from limestones is intermixed. Accordingly, it has a higher content of sand than the Taft soil.

The Robertsville and Tyler soils are poorly drained. They are characterized by gray surface soils and gray to mottled compact subsoils. These two soils are similar. The Robertsville silt loam, however, was derived from limestone, whereas the Tyler very fine sandy loam originated chiefly from sandstone and shale and a smaller mixture of limestone material.

Soils on old colluvial land (old local alluvium)

Colluvial lands are the sloping fans and benches at the base of slopes. They consist of a mixture of local alluvium and colluvium that has been washed or has sloughed from the higher lying adjacent slopes. The old colluvial land is on the higher fans or benches; the young colluvial land, in general, is along the drainageways leading from the higher adjacent upland.

The Hermitage, Allen, and Jefferson are all well-drained soils on old colluvial land. The Hermitage soils are reddish; they consist of material derived chiefly from limestone. In contrast, the Allen and Jefferson soils consist of material derived largely from sandstone. Where the adjacent upland slopes are underlain by a series of sandstone, shale, and limestone, however, the parent material of the Allen and Jefferson soils consists of a

mixture of these various rocks. The Allen soils are distinguished from the Jefferson soils by their browner surface layer and more reddish subsoil. Both are friable and permeable to roots and moisture.

The Hollywood silty clay soils are somewhat poorly drained. They consist of alluvial and colluvial material derived mainly from clayey, or argillaceous, limestone. They are distinguished by their dark color, high clay content, and less acid reaction than is characteristic of other soils on old colluvial land. Bedrock is at shallower depths than is characteristic of the Jefferson, Allen, and Hermitage soils.

Soils on young colluvial land (young local alluvium)

The Melvin, Lee, Dunning, and Prader soils are poorly drained. They are characterized by grayish or mottled firm subsoils. The Melvin, Lee and Prader soils have gray surface layers, but the surface layer of the Dunning soil is dark grayish brown. Melvin silty clay loam was derived largely from high-grade limestone, whereas Lee silt loam was derived largely from cherty limestone. Prader fine sandy loam was derived largely from sandstone and shale material intermixed with some limestone material. Dunning silty clay consists largely of materials derived from clayey, or argillaceous, limestone; many of the areas are associated with or adjacent to areas of Hollywood soils.

Bruno loamy fine sand is excessively drained. It consists almost wholly of fine sand or loamy fine sand; the [illegible] of this soil is the result of rapid stream flow at the

TABLE 6.—*Acreage and proportionate extent of the soils mapped in Madison County, Ala.*

Soils	Area	Extent
	Acres	*Percent*
Abernathy cherty silt loam	1, 222	0. 2
Abernathy fine sandy loam	3, 665	. 7
Abernathy silt loam	30, 540	6. 0
Allen clay loam, severely eroded rolling phase	1, 731	. 3
Allen fine sandy loam:		
Undulating phase	407	. 1
Eroded udulating phase	4, 377	. 9
Eroded rolling phase	1, 313	. 3
Allen stony fine sandy loam:		
Eroded undulating phase	153	(1)
Eroded rolling phase	719	. 1
Eroded hilly phase	132	(1)
Baxter cherty silt loam:		
Undulating phase	1, 120	. 2
Eroded undulating phase	10, 511	2. 1
Rolling phase	1, 374	. 3
Eroded rolling phase	11, 402	2. 2
Hilly phase	280	. 1
Eroded hilly phase	1, 018	. 2
Baxter cherty silty clay loam:		
Severely eroded undulating phase	458	. 1
Severely eroded rolling phase	5, 105	1. 0
Severely eroded hilly phase	560	. 1
Bodine cherty silt loam:		
Hilly phase	764	. 1
Eroded hilly phase	438	. 1
Steep phase	433	. 1
Bruno loamy fine sand	244	(1)
Captina and Capshaw loams, undulating phases	499	. 1
Captina and Capshaw silt loams:		
Level phases	4, 215	. 8
Undulating phases	1, 252	. 3
Colbert cherty silt loam, undulating phase	188	(1)
Colbert cherty silty clay loam:		
Eroded undulating phase	1, 222	. 2
Eroded rolling phase	1, 558	. 3

Soils	Area	Extent
	Acres	*Percent*
Dickson silt loam:		
Level phase	2, 036	0. 4
Undulating phase	12, 216	2. 4
Eroded undulating phase	5, 930	1. 2
Dowellton silt loam	148	(1)
Dunning silty clay	695	. 1
Egam silty clay loam	1, 832	. 4
Ennis silt loam	3, 156	. 6
Etowah cherty silt loam, undulating phase	509	. 1
Etowah loam:		
Level phase	305	. 1
Undulating phase	764	. 1
Eroded undulating phase	373	. 1
Etowah silt loam:		
Level phase	1, 273	. 3
Undulating phase	2, 749	. 5
Etowah silty clay loam:		
Eroded undulating phase	2, 659	. 5
Eroded rolling phase	97	(1)
Greendale cherty silt loam	3, 716	. 7
Greendale silt loam	10, 455	2. 1
Guthrie silt loam	11, 218	2. 2
Hamblen fine sandy loam	1, 893	. 4
Hartsells fine sandy loam:		
Undulating phase	1, 349	. 3
Eroded undulating phase	305	. 1
Rolling phase	4, 072	. 8
Eroded rolling phase	825	. 2
Undulating shallow phase	244	(1)
Eroded undulating shallow phase	214	(1)
Rolling shallow phase	1, 018	. 2
Eroded rolling shallow phase	255	. 1
Hermitage cherty silt loam:		
Eroded undulating phase	2, 688	. 5
Rolling phase	356	. 1
Eroded rolling phase	6, 271	1. 2
Eroded hilly phase	3, 624	. 7

TABLE 6.—*Acreage and proportionate extent of the soils mapped in Madison County, Ala.*—Continued

Soils	Area	Extent
	Acres	*Percent*
Ooltewah fine sandy loam	1, 955	0. 4
Ooltewah silt loam	9, 467	1. 9
Pearman loam	265	. 1
Pits:		
Clay		(1)
Gravel		(1)
Prader fine sandy loam	1, 018	. 2
Robertsville silt loam	7, 991	1. 6
Rockland, limestone:		
Steep	69, 453	13. 6
Hilly	12, 216	2. 4
Rolling	2, 800	. 6

***Figure 4.*—An excellent crop of soybean hay on Abernathy silt loam**

for late summer grazing; pasture grasses and legumes re-

Use suitability.—Practically all of this soil is cropped. Row crops in particular are grown extensively. Corn is probably the most extensive; other important crops are cotton, soybeans, grain sorghum, and hay crops such as soybeans and lespedeza. Like Abernathy silt loam, this soil is suited to intensive use. The number of crops for which it is well suited, however, is restricted. Small grains tend to lodge, fall-sown crops may be damaged by excess water during the winter, and sometimes cotton does not fruit well. The soil is desirable for pasture because the abundant moisture is favorable for legumes and grasses during the drier parts of the growing season. Use and management methods are discussed in group 1 in the section Use and Management of Soils.

Abernathy fine sandy loam (0 to 2 percent slopes) (Ac).—This brownish soil consists of local alluvium de-

Profile description:

0 to 7 inches, grayish-brown to reddish-brown fine sandy loam.
7 to 13 inches, grayish-brown to reddish-brown friable fine sandy clay loam.
13 to 25 inches, reddish-brown to yellowish-red firm fine sandy clay that breaks to subangular nutlike pieces; below depths of 13 to 25 inches the material may be reddish brown or brownish red, in some places grading to a lighter color that is somewhat variegated or mottled with yellow; limestone bedrock is at depths of 3 to 8 feet or more.

Limestone or sandstone fragments occur in some areas, especially on the surface. In some fields they have been picked up and piled along the fences. A few patches of this soil are eroded but are too small to be significant.

A few small areas of Abernathy fine sandy loam are included with this soil as mapped.

Allen fine sandy loam, undulating phase, is medium to strongly acid. Its supply of organic matter is not so large

medium internal drainage. It is medium to strongly acid. The surface soil has fairly good to good tilth, and the subsoil is permeable to roots and moisture. Except in the more severely eroded patches, where the moisture supply is limited, the soil has a moderate capacity for holding moisture available to plants. Erosion is a hazard on the more sloping areas if the soil is not well protected by a cover crop.

Use suitability.—All of the soil has been cropped at some time. Except for that part that lies within the arsenal areas south of Huntsville, most of it is now cropped or in pasture. Cotton and corn are among the most extensive crops, but small grains, soybeans, grain sorghum, and lespedeza and other hay crops are grown on some of the acreage.

This soil is well suited to tilled crops. Because of its moderate fertility and moderate slopes, however, it requires careful maintenance of fertility and control of runoff. Moderate rotations can be used in which close-growing crops such as small grains and hay are grown 2 or 3 years in a 3- or 4-year rotation. Fertilizers must be applied regularly if fertility is to be kept at a high level. Use and management methods are discussed under group 4 in the section Use and Management of Soils.

Allen fine sandy loam, eroded rolling phase (6 to 12 percent slopes) (Ao).—This phase differs from the undulating phase of Allen fine sandy loam in having a stronger slope and significant soil loss through erosion. As a result of this loss, the present plow layer usually consists of a mixture of surface soil and former subsoil material.

Most areas of this soil are of moderate size. They occupy positions on the colluvial slopes directly below and adjacent to the steep mountain slopes. They usually occur in the Allen-Jefferson soil association.

The plow layer to a depth of 5 or 6 inches is reddish-brown fine sandy loam. The subsoil is reddish-brown to yellowish-red firm fine sandy clay loam. At depths of 50 to 60 inches the soil generally grades to a reddish-yellow or predominantly yellowish material, splotched or mottled with light yellow or gray. Depth to limestone bedrock usually ranges from about 2 to 7 feet but in some places may be much greater.

Some patches, especially on the stronger slopes, have lost practically all the surface soil through erosion. In these areas the plow layer consists of reddish-brown firm fine sandy clay loam that may be cut by small shallow gullies. Limestone and sandstone fragments occur in some areas.

Allen fine sandy loam, eroded rolling phase, is a moderately fertile soil, but the content of organic matter is fairly low. It is medium to strongly acid. Tilth is good in the plow layer where erosion has not been so active, but is poor in severely eroded areas. If the eroded areas are too wet when cultivated, the soil puddles; if they are too dry, it breaks into hard lumps. Although the subsoil is firm, it is permeable to roots and moisture.

Because of the rather strong slope, erosion is active if the soil is not protected by a close-growing vegetative cover. Internal drainage is medium, and the soil has a moderate capacity for holding moisture available to plants. The more eroded areas, however, are inclined to be droughty.

Use suitability.—All of this soil has been cultivated at

soybeans, lespedeza, and sorghum are also important. Yields are only moderate. Fertilizer is usually applied if row crops are to be grown. Lime has been added to much of the soil. As a rule, crops are not rotated consistently.

This soil is suited to practically all of the crops commonly grown in the county, including cotton, corn, small grains, and the more exacting legumes and grasses for hay and pasture. It has good workability but is eroded by surface runoff in cultivated areas. Where erosion is severe, tillage causes the soil to puddle when too wet and to break into hard lumps when too dry. Rotations of moderate length that consist mainly of close-growing crops are needed to provide a protective plant cover. Use and management methods are discussed under group 11 in the section Use and Management of Soils.

Allen clay loam, severely eroded rolling phase (6 to 12 percent slopes) (Al).—Most areas of this severely eroded soil are small. They occupy the stronger slopes in areas of rolling Allen soils and are distributed throughout the Allen-Jefferson soil association. The most extensive acreage is at Big Cove southeast of Huntsville.

The 5- to 6-inch plow layer consists of reddish-brown clay loam. The subsoil is reddish-brown to yellowish-red friable to firm fine sandy clay loam to clay loam. Below approximately 36 inches, the soil grades to a lighter color splotched or variegated with yellow and some gray. Limestone bedrock is usually at 1½ to 6 feet but occurs at greater depths in some areas.

In places, part of the subsoil has been eroded away, and some patches have small shallow gullies. Limestone and sandstone fragments occur in some areas.

Allen clay loam, severely eroded rolling phase, has low fertility, and its content of organic matter is small. It is medium to strongly acid. Tilth is poor in the surface layer. The soil is moderately permeable to roots but has a slow infiltration rate. Capacity for holding moisture available to plants is low so that the soil is generally droughty.

Use suitability.—All of this soil has been cropped at some time, but only a small part is now cultivated. Much of it is idle or is pastured. About 25 percent of the soil has reverted to forest, chiefly pines. Crops are mainly cotton and corn, but some lespedeza and other hay crops are grown. Generally, yields are rather low; some of the soil is cropped for 1 or 2 years and then allowed to lie idle for 3 or 4 years.

This soil is suitable for tilled crops, but its low fertility, poor tilth, unfavorable moisture, and susceptibility to erosion are limiting factors. Most of it requires long rotations that consist principally of close-growing small grains, hay, and pasture. Because of inadequate moisture, the grazing capacity of the soil is very limited, especially during the drier parts of the year. Use and management methods are discussed under group 12 in the section Use and Management of Soils.

Allen stony fine sandy loam, eroded undulating phase (2 to 6 percent slopes) (Ap).—This is a reddish well-drained soil. Throughout its profile are limestone and sandstone fragments that interfere with field work. The soil consists of old local alluvium and colluvium derived mainly from sandstone and shale intermixed

and Jefferson soils. The acreage is not extensive. Separate areas are small and are widely distributed throughout the Allen-Jefferson soil association.

The 5- to 6-inch plow layer usually consists of a mixture of the original surface soil and subsoil and is predominantly reddish-brown stony fine sandy loam. The subsoil is reddish-brown to yellowish-red friable to firm

Use suitability.—Although all of this soil has been cleared and was cropped at some time, less than 60 percent is now used for crops. Much of the rest is idle or has reverted to forest, which is mostly pine. Areas that are not cropped are sometimes pastured but usually have not been improved. Cotton and corn, the chief crops, are sometimes fertilized, but yields are usually not high.

Although the soil is suitable for most or many common

Like other Baxter soils, this soil is distinguished from the Cookeville soils by its more cherty and lighter colored surface soil and subsoil. It is distinguished from the Dickson soils by its reddish rather than yellowish subsoil and by the lack of the siltpan common to the Dickson soils. In general, those parts of the landscape occupied by the Baxter soils are more rolling than those occupied by the Dickson and Cookeville soils and are commonly closer to the drainageways. Baxter cherty silt loam, undulating phase, is distinguished by its gentle slope.

Profile description:

0 to 7 inches, grayish-brown friable cherty silt loam; areas that have not been cultivated have a 1- or 2-inch surface layer that is darker because its organic-matter content is higher; chert comprises from 15 to 30 percent of this layer, enough to interfere materially with cultivation; most chert fragments range from ¼ to about 3 inches in diameter, but some are larger.

7 to 12 inches, light yellowish-brown to brown friable cherty silt loam that grades with depth to cherty silty clay loam.

12 to 48 inches, yellowish-red firm cherty silty clay or clay; lower part faintly mottled with gray and reddish brown.

48 inches +, splotched or mottled red, yellow, and gray firm to very firm cherty clay; depth to cherty limestone bedrock ranges from 10 to 40 feet.

The content of plant nutrients and organic matter is low to moderate, and the soil is medium to strongly acid. The surface layer has good tilth. Although the chert fragments interfere with tillage, they make the soil more permeable. The soil is permeable to roots and moisture, and it has a moderate capacity for holding moisture available to plants.

Use suitability.—About one fourth of the acreage is still

matter. Internal drainage is medium. The soil is permeable to roots and moisture; tilth is usually fairly good. Throughout the entire profile, the soil is medium to strongly acid. Capacity for holding moisture available to plants is moderate. Erosion is a hazard, especially on the more sloping areas, and a few small gullies occur, most of which are represented on the soil map by symbol.

Use suitability.—All of this soil has been cropped at some time, and most of it is cropped at present. Cotton and corn are the principal crops, and moderate yields are obtained under usual management. Mixed fertilizer is commonly used for cotton. Part of the soil is used for hay and pasture. Lespedeza is the most common of the hay crops.

The smooth surface, fairly good tilth, moderately favorable moisture, and response to good management make this a fairly desirable soil for crops and pasture. Chert interferes with tillage, and erosion has impaired tilth and diminished moisture-holding capacity to some extent. This soil, like the undulating phase of Baxter cherty silt loam, warms early in spring. Consequently, it is favorable for growing cotton and certain truck crops for early market. Use and management are discussed under group 3a in the section Use and Management of Soils.

Baxter cherty silty clay loam, severely eroded undulating phase (2 to 6 percent slopes) (Bc).—This severely eroded soil occupies single slopes in close association with other Baxter soils. Almost all areas are in the Baxter-Cookeville-Dewey soil association. They are small in size and total area.

Profile description:

0 to 7 inches, grayish-brown cherty silt loam.
7 to 12 inches, light yellowish-brown to brown friable cherty silt loam that grades to cherty silty clay loam with depth.
12 to 40 inches, yellowish-red firm cherty silty clay that grades to weakly mottled material.
40 inches +, splotched or mottled red, yellow, and gray firm to very firm cherty clay; limestone bedrock is at depths of 8 to 36 feet.

This medium to strongly acid soil has a moderate supply of plant nutrients and organic matter. Although there is enough chert in the surface soil to interfere materially with cultivation and mowing, the soil has good tilth and or the whole is permeable to moisture and roots. Internal drainage is medium. The soil has a moderate capacity for holding moisture available to plants.

Use suitability.—Most of this soil is under native forest, but its favorable tilth, good internal drainage, and ability to respond to good management make it suitable for cultivated crops. Because of rather strong slopes and moderately low fertility, however, it must be carefully managed in order to maintain productivity. Under good management rotations of moderate length can be used. The soil is suitable for practically all of the usual crops, such as cotton, corn, small grains, sorghum, and soybeans and the commonly grown legumes and grasses for hay or pasture. Use and management are discussed under group 9 in the section Use and Management of Soils.

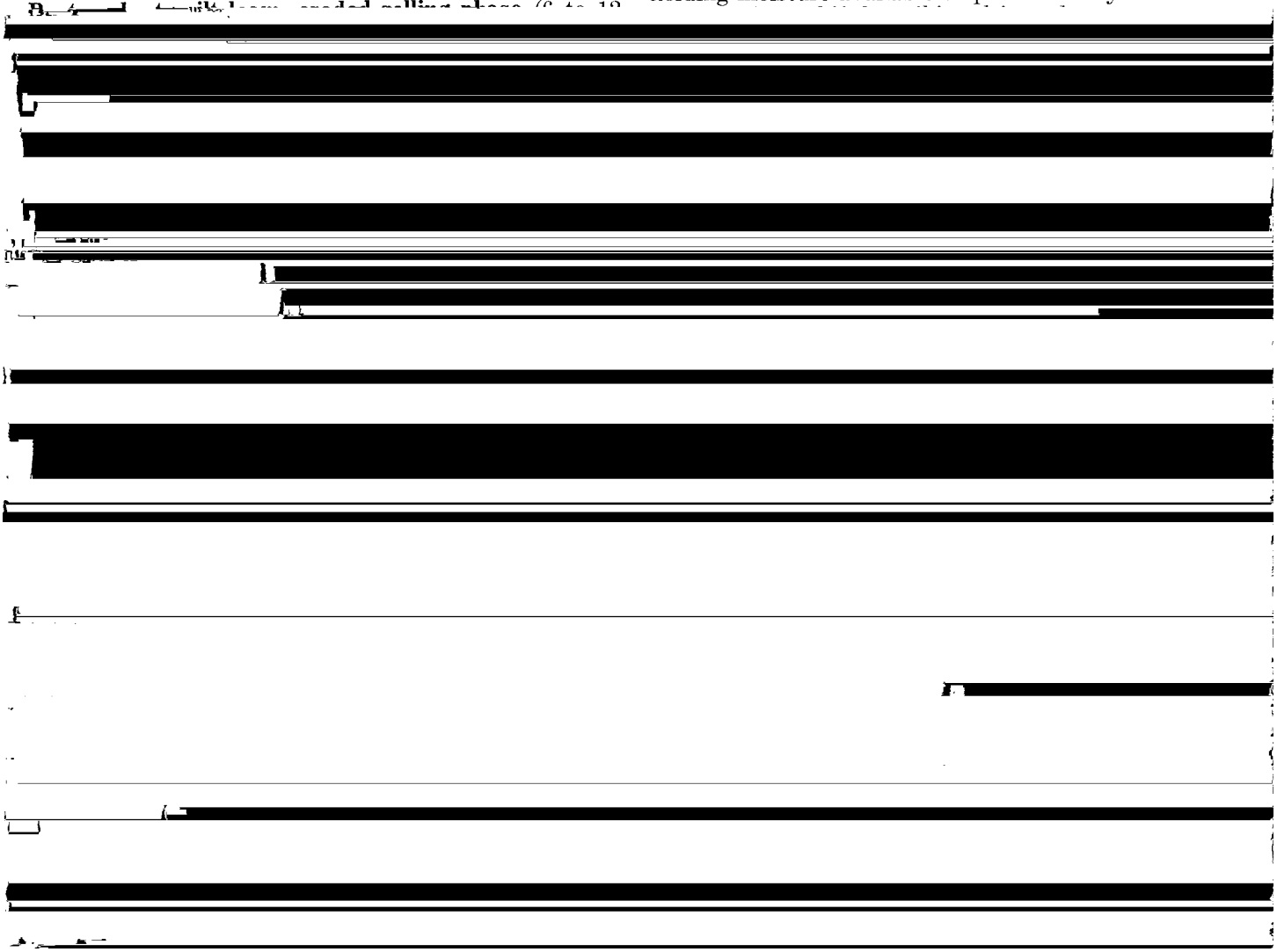
fertilizers are added if row crops are to be grown, particularly cotton.

This soil is suitable for tilled crops but its strong slope, chertiness, and somewhat low fertility limit its suitability for this purpose. It is suited to the wide variety of crops that is commonly grown—cotton, corn, small grains, and the usual legumes and grasses for hay and pasture. Rather long rotations and adequate fertilization are needed if the soil is to remain productive. Use and management are discussed under group 9 in the section Use and Management of Soils.

Baxter cherty silty clay loam, severely eroded rolling phase (6 to 12 percent slopes) (BH).—Areas of this soil range from 5 to 30 acres in size. They are widely scattered throughout the Baxter-Cookeville-Dewey soil association. Some acreage is in the Dickson-Lawrence association.

The 5- to 6-inch plow layer is usually yellowish-red cherty silty clay loam but in places is cherty silty clay. The subsoil is yellowish-red cherty silty clay. Below about 36 inches, the soil is splotched red, yellow, and gray cherty silty clay or cherty clay. Cherty limestone bedrock occurs at depths of 6 to 36 feet. Small gullies are common. A few fairly large gullies occur, and it will require considerable work to fill them.

The content of organic matter and plant nutrients is low. Tilth is very poor, and internal drainage is moderate. Permeability is moderate to slow, and the capacity for holding moisture available to plants is very low. Erosion



Use suitability.—All of this soil is under native forest. Its strong slope, chertiness, and rather low content of plant nutrients make it poorly suited to cultivated crops. It can be cropped under a very long rotation, but great care is required to restrain runoff and to maintain fertility. If adequately fertilized and properly seeded, it affords a fair amount of good-quality grazing. Use and management are discussed under group 13 in the section Use and Management of Soils.

Baxter cherty silt loam, eroded hilly phase (12 to 20 percent slopes) (BF).—This soil is widely distributed throughout the Baxter-Cookeville-Dewey soil association. A few tracts may occur along the stronger slopes adjacent to the larger drains in the Dickson-Lawrence soil association.

The 4- to 5-inch plow layer is brownish-yellow to yellowish-red cherty silt loam. The subsoil is yellowish-red cherty silty clay loam to cherty silty clay that grades, at 30 inches or so, to mottled or splotched red, yellow, and gray cherty silty clay or clay. Bedrock limestone is at depths of 6 to 32 feet.

The texture of the plow layer varies according to the amount of erosion that has taken place. In a few places the surface soil is predominantly grayish-brown cherty silt loam. In contrast, many patches have lost practically all of the surface soil and some of the subsoil, and the plow layer now consists of yellowish-red cherty silty clay loam or cherty silty clay. Small gullies are common. A few gullies are so large that they will be difficult to fill by use of ordinary tillage implements.

This soil is rather low in plant nutrients and organic matter. It is medium to strongly acid. In the less eroded areas, tilth is good and internal drainage is medium; in the more severely eroded patches, tilth is very poor and internal drainage is slow. The capacity for holding moisture available to plants is moderate over most of the acreage. In the more severely eroded areas, however, it is very low; these areas are droughty and will become hard when dry. Erosion caused by runoff is a great hazard whenever the soil is tilled.

Use suitability.—All of this soil has been cleared and cropped. At the present time, however, probably not over a third is cropped regularly. In some areas corn and cotton are grown for 1 or 2 years and followed by 2 or 3 years of unimproved pasture. Light applications of fertilizer are used for cotton.

Strong slope, chertiness, and low fertility make this soil rather poorly suited to tilled crops. Where cropland is limited, the soil can be cropped if it is carefully managed. Generally, most of it should be pastured. A moderate carrying capacity can be maintained if the soil is adequately fertilized and properly seeded. Sericea lespedeza is one of the more desirable legumes. Use and management methods are discussed under group 13 in the section Use and Management of Soils.

Baxter cherty silty clay loam, severely eroded hilly [redacted]

This soil is very low in content of organic matter and plant nutrients and is medium to strongly acid. Tilth is very poor. Internal drainage is slow. Compared to the surface soil of the uneroded areas, permeability of the topmost 7 or 8 inches is very slow. Roots and moisture, however, can penetrate the soil. This soil is droughty because it has a very low capacity for holding moisture available to plants. The chert is sufficiently abundant to interfere with cultivation.

Use suitability.—All of this soil has been cultivated at some time, but very little is now cropped. Corn is the chief crop and is commonly rotated with lespedeza for hay or pasture. Yields are low. The soil is poorly suited to crops because of strong slope, unfavorable moisture, and low fertility. If it is adequately fertilized, however, and properly seeded, it is moderately productive of pasture grasses and legumes. Its carrying capacity, however, is greatly limited by its low moisture supply. Use and management are discussed under group 13 in the section Use and Management of Soils.

Bodine cherty silt loam, hilly phase (12 to 20 percent slopes) (BN).—Like other Bodine soils, this is a cherty light-colored permeable soil that is moderately shallow to beds of chert. Areas are widely distributed. They occur in the more hilly parts of the uplands in the Dickson-Lawrence soil association in the northwestern part of the county. This soil is distinguished from the Baxter soils by a lack of profile development, a shallower depth to chert beds, and yellowish rather than reddish color.

Profile description:

0 to 3 inches, pale-brown to grayish-brown friable cherty silt loam; in forested areas the surface 1 inch has a higher content of organic matter that causes it to be much darker in color.

3 to 10 inches, grayish-brown, grading to yellowish-brown, friable cherty silt loam.

10 inches +, a mixture of brownish-yellow clay and chert; chert beds occur at depths of 1½ to 3 feet, and solid bedrock at depths ranging from a few feet to 10 or 12.

This soil is low in plant nutrients and organic matter. It is medium to strongly acid. Natural drainage is somewhat excessive; internal drainage is medium to very rapid. The tilth of the surface layer is favorable, but the chert is sufficiently abundant to interfere greatly with tillage. Moisture and roots penetrate the soil readily. The capacity for holding moisture available to plants is moderate to rather low, depending on the amount of chert. Erosion is active on cultivated areas. The chert content and moderately rapid permeability, however, make this soil less subject to erosion than such chert-free firm soils as the Decatur, Hermitage, and Talbott.

Use suitability.—Practically all of this soil is still under native deciduous forest. Its strong slope, chert content, and low fertility make it poorly suited to cultivated crops. Much of it can be made fairly suitable for pasture if its fertility is improved and it is properly seeded. If any of this soil must be planted to tilled crops, rotations that consist largely of close-growing small grains and legume

The plow layer is pale-yellow cherty silt loam that grades within a few inches to a mixture of brownish-yellow clayey material and chert. Beds of chert are at depths of 1½ to 3 feet, and cherty limestone bedrock at depths ranging from a few feet to 10 or 12

This soil is very low in plant nutrients and organic matter. Usually it is medium acid. The material is very loose, and permeability is very rapid. The capacity for holding moisture available to plants is low. In most areas, however, the water table is at depths of 5 to 6 feet

rather low content of organic matter. It is medium to strongly acid. The plow layer has good tilth. The soil material to a depth of at least 25 inches is permeable to both roots and moisture. It has a moderately high capacity for holding moisture available to plants, and internal drainage is slow. In general, this complex has many of the favorable features of Etowah silt loam, undulating phase. Its internal drainage, however, is

Captina and Capshaw loams, undulating phases (2 to 6 percent slopes) (CA).—All of this complex occurs in the southeastern part of the county in the Holston-Tupelo-Robertsville soil association.

The 7- to 8-inch surface layer is pale-yellow loam. The subsoil to a depth of about 26 inches is light yellowish-brown to yellowish-brown friable to firm clay loam, which may be somewhat mottled in the lower part. Below

strong blocky structure, the mass breaking easily to subangular fragments.
30 to 44 inches, mottled brownish-yellow, yellowish-brown, and gray very firm silty clay; stone bedrock at 1½ to 4 feet.

The color of the surface layer ranges from yellowish gray to yellowish brown and occasionally to the dark olive brown characteristic of the surface soil of Hollywood silty clay. In a few areas, a considerable quantity of fine sand or very fine sand is intermixed in the surface layer. A few limestone boulders or loose rock occur, but bedrock outcrops are not common.

Colbert silt loam, undulating phase, is moderately low in fertility and organic matter and is medium to strongly acid. The thin surface layer has favorable tilth, but the subsoil is slowly permeable to moisture and roots. Internal drainage is slow. This soil has a rather low capacity for holding moisture available to plants and is inclined to be droughty during excessively dry periods.

Use suitability.—Most of this soil has been cleared and cultivated. About 75 percent is now cropped or is in permanent pasture. The rest is in forest. Cotton, corn, lespedeza, and soybeans are the chief crops. The slow permeability causes runoff to develop quickly. Consequently, the shallow surface soil is easily eroded, especially on the more sloping areas. This soil is less favorable for many crops than the better drained more permeable soils because of its droughtiness and slow permeability. It is not particularly suitable for row crops, but if fertilized and otherwise well managed, it is moderately productive of many hay crops, pasture, and small grains. Use and management methods are discussed under group 7 in the section Use and Management of Soils.

Colbert silty clay loam, eroded undulating phase (2 to 6 percent slopes) (CL).—The plow layer of this eroded soil is a mixture of surface soil and subsoil. The soil is the most extensive of the Colbert soils. It is widely distributed throughout the Hermitage-Talbott-Colbert soil association.

The surface layer is brownish-yellow silty clay loam. The subsoil is brownish-yellow very firm silty clay faintly be used. Use and management are discussed under group 7 in the section Use and Management of Soils.

Colbert silty clay loam, eroded rolling phase (6 to 12 percent slopes) (CM).—So much of the surface soil of this phase has been lost that the plow layer usually consists of a mixture of surface soil and subsoil material. This soil is widely distributed throughout the Holston-Tupelo-Robertsville and the Hermitage-Talbott-Colbert soil associations.

The 4- to 5-inch plow layer is brownish-yellow silty clay loam. This is underlain by faintly mottled brownish-yellow very firm silty clay. Below about 14 inches the soil is mottled light-gray, pale-yellow, reddish-yellow, and yellowish-red very firm silty clay or clay. Limestone bedrock is at depths of ½ to 2½ feet. In a very few places shallow or low outcrops of bedrock occur. In many patches all of the original surface soil has been removed by erosion and the plow layer consists of brownish-yellow very firm silty clay.

This soil is rather low in fertility and organic matter. It is medium to strongly acid. Tilth of the plow layer is rather poor, particularly in the more eroded areas. The soil is slowly permeable. The capacity for holding moisture available to plants is low, and the more eroded spots are droughty. Internal drainage is slow. During rains runoff water accumulates rapidly and causes erosion, especially on the more sloping areas.

Use suitability.—A large part of this soil has been cropped at some time. The few small areas that are still under native forest are not significantly eroded. Much of the soil is now in unimproved pasture, and a small acreage has reverted to forest. In the small area that is cropped, cotton, corn, lespedeza, and other general farm crops, such as soybeans and peas, predominate. Annual lespedeza, hop clover, and Dallisgrass are the principal pasture plants.

This soil can be used for tilled crops. Its slow permeability, rather unfavorable tilth, low capacity for holding moisture available to plants, and moderately strong slope,

The soil has a rather low content of plant nutrients. **Colbert cherty silty clay loam, eroded undulating phase**

This soil is greatly limited in suitability for crops by the chert fragments, rather strong slope, and shallow depth to the very firm clayey subsoil. It will produce fairly good yields of small grains and of legumes and grasses for hay and pasture. It is not well suited to row crops, mainly because of the limited moisture available to plants, unfavorable tilth, and the susceptibility of most of the soil to severe erosion. Use and management methods are discussed in group 10 in the section Use and Management of Soils.

Colbert fine sandy loam, eroded undulating phase (2 to 6 percent slopes) (CG).—A sandier surface layer [redacted] mountains. Most of it is on smooth or undulating landscapes.

Profile description:

0 to 7 inches, pale-brown friable silt loam.
7 to 16 inches, reddish-yellow or yellowish-red heavy but friable silt loam that grades to silty clay loam.
16 to 30 inches, yellowish-red firm silty clay loam that grades to silty clay; the mass breaks easily to blocky pieces ½ to 1½ inches in diameter.
30 inches +, yellowish-red or red firm silty clay that contains some chert; faintly to strongly mottled with yellow, brown, and gray; limestone bedrock at depths of 10 to 40 feet.

The color of the surface layer ranges from pale brown to light reddish brown. Some patches have a dark

some acreage is in hay, chiefly soybeans, lespedeza, alfalfa, and sericea lespedeza. Minor crops are potatoes, grain, soybeans, melons, and tomatoes. Some of the soil is in

home gardens and home orchards. Cotton receives moderately heavy applications of fertilizer, and yields are moderately high.

The smooth surface, favorable moisture supply, good tilth, and responsiveness to good management make this one of the more desirable soils of the county for crops and pasture. It is suitable for a number of crops including alfalfa, cotton, small grains, corn, and many truck crops. If the soil is carefully managed and adequately fertilized,

of the arsenal areas. It is associated with Dewey and Decatur soils.

Profile description:

0 to 5 inches, grayish-brown to dark-brown very friable loam.
5 to 8 inches, brown to reddish-brown loam that grades to fine sandy clay loam; crushes easily to a friable mass.
8 to 24 inches, dark reddish-brown to dark-red moderately firm very fine sandy clay loam to silty clay loam; breaks easily to blocklike fragments from ½ to 1½ inches in diameter.
24 to 48 inches, dark reddish-brown to dark-red (grading with depth to yellowish-red or light brownish-red) moderately firm silty clay; contains some very fine sand that grades to more friable material with depth; lower part of the

permeable to roots and moisture and has a moderately high capacity for holding moisture available to plants. It is one of the most productive and most easily worked and conserved soils of the county.

Use suitability.—Most of this soil has been cropped at some time, and practically all of it outside the arsenal area is used for crops, mainly cotton and corn. Good yields are obtained if adequate fertilizer is used. Management requirements are the same as those of the undulating phase. Use and management methods are discussed under group 3 in the section Use and Management of Soils.

Cumberland loam, eroded rolling phase (6 to 12 percent slopes) (Cw).—Practically all of this soil occurs in the southern part of the county in the vicinity of Triana.

The 5- to 6-inch plow layer consists of brownish-red loam or clay loam. The subsoil is dark reddish-brown to dark-red, firm, very fine sandy clay loam or silty clay loam. Below about 20 inches the color grades to yellowish red. Streaks or splotches of yellow and gray are evident at about 25 inches. In some areas an irregular bed of gravel occurs at depths of 2½ to 7 feet. Limestone bedrock is at depths of 4 to 15 feet. Fine dark concretions are common throughout the soil, and in some areas there may be a few chert fragments.

Many patches on the steeper slopes have lost all of the original surface soil. Here, the plow layer consists of the dark reddish-brown silty clay loam subsoil in which a few small gullies may occur.

Cumberland loam, eroded rolling phase, has good drainage, although runoff is somewhat excessive. It is moderately high in content of plant nutrients and organic matter and is medium to strongly acid. Tilth is good on the less eroded areas, but the soil is cloddy where erosion is more severe. Although the soil is permeable to roots and moisture in the less eroded areas, permeability is somewhat retarded where the plow layer consists of subsoil material.

Use suitability.—Practically all of this soil has been cleared. Most of it outside the arsenal area is used for pasture or crops. Cotton and corn are the chief crops, and good yields are obtained if the soil is well managed. Adequate fertilization is especially necessary.

This soil is suited to a number of crops, including cotton, alfalfa, and small grains. The fairly good tilth, good drainage, and productivity under good management make it one of the better soils for crops. Special attention to water control is necessary, however, because of the moderately strong slope. Accordingly, moderately long rotations should be used, and tillage should be on the contour. The more eroded sloping areas should be pastured much of the time. Use and management methods are discussed under group 8 in the section Use and Management of Soils.

Decatur and Cumberland silt loams, undulating phases (2 to 6 percent slopes) (Db).—The dark-red, well-drained soils of this mapping unit have firm subsoils that are deep to bedrock limestone. The Decatur silt loam consists of residuum from high-grade limestone, and the Cumberland consists of old general alluvium derived largely from high-grade limestone. In Madison County these Decatur and Cumberland soils have physical characteristics so nearly alike and are so intermixed that it was impractical to map them separately. Cumberland loam, however, is described and mapped separately, as it contains enough sand to distinguish it from the finer textured Decatur soils.

Soils of this mapping unit are extensive. In general, they occur on broad smooth landscapes, large acreages of which are well suited to crops. They are distributed widely throughout much of the Decatur-Cumberland-Abernathy soil association. Much of the acreage is associated with the undulating and rolling Cookeville and Abernathy soils. Most areas of this complex are north of Madison and Huntsville, and ranging northeastward to the vicinity of Plevna.

Profile description of Decatur silt loam (fig. 6):

0 to 9 inches, dark-brown to dark reddish-brown friable but heavy silt loam.
9 to 13 inches, reddish-brown friable silty clay loam that loses its brownish cast and becomes redder with depth; breaks to fine subangular blocky fragments.
13 to 60 inches, dark reddish-brown to dark-red firm silty clay that grades to lighter red with depth; lower part of layer firmer in consistence; fine to medium subangular blocky structure of moderate grade.
60 inches +, red very firm silty clay splotched or streaked with light red and yellow; breaks to somewhat larger, more angular fragments than those of the layer above; limestone bedrock at depths of 5 to 20 feet.

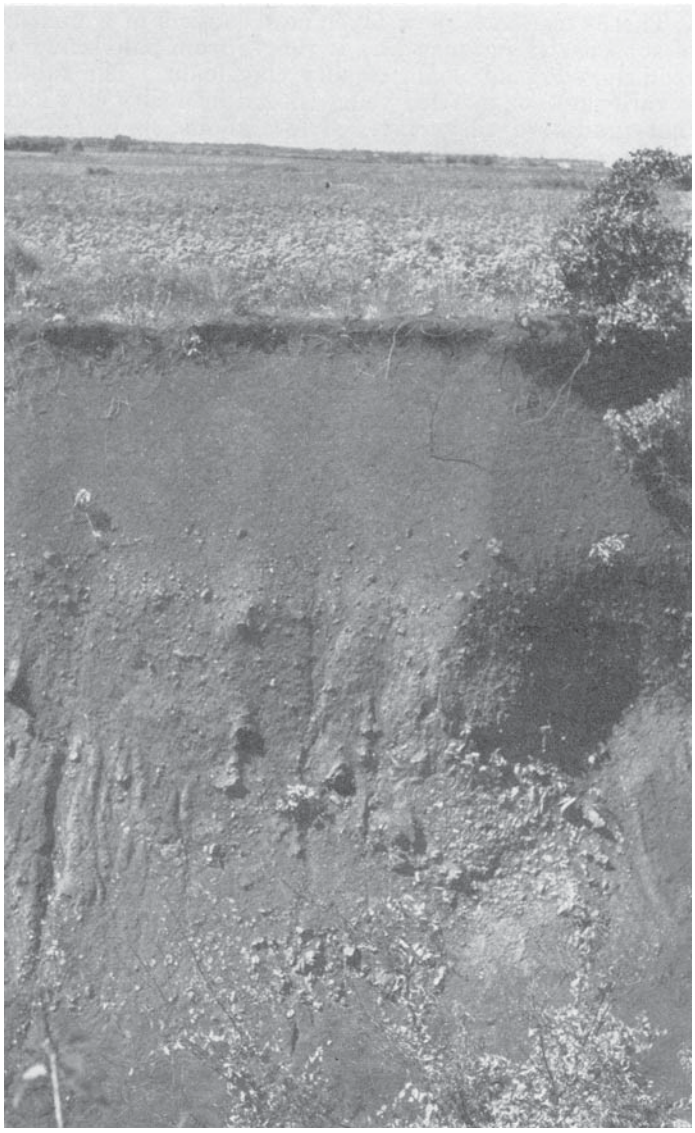


Figure 6.—**Profile of Decatur silt loam in a landscape of Decatur and Cumberland silt loams, undulating phases.**

That part of the complex consisting of Cumberland soil has the silty clay loam texture to a somewhat greater depth than the Decatur soil. In general the Cumberland soil, to a depth of 30 inches or more, is somewhat more friable than the Decatur. Moreover, in some areas of Cumberland silt loam, there is a considerable quantity of fine sand to depths of 2 or 3 feet, and in places there are a few pieces of quartzite gravel.

Many fine to very fine dark concretions occur throughout the profile of this complex of Decatur and Cumberland soils. They appear to have a considerable content of manganese. In many areas a considerable amount of chert occurs below a depth of 3 or 4 feet.

The supply of plant nutrients in this complex is high, and compared with the other soils of Madison County, its supply of organic matter is high. It is medium to strongly acid. The tilth of the plow layer is good. In many places, however, tillage implements do not scour so well as in the plow layer of some of the lighter colored soils such as Dickson silt loam. The soil is moderately permeable to roots and moisture, and the capacity for holding moisture available to plants is moderately high. Erosion is not a great hazard, except on the more sloping areas. Even on these areas, it is not difficult to control.

Use suitability.—Practically all of this complex is used for crops, principally cotton, corn, and hay. Cotton is by far the most extensive. Alfalfa is an important hay crop

ately permeable. Internal drainage is medium. The soils have a moderately high capacity for holding moisture available for plant use. The more eroded areas, however, are inclined to be droughty.

Use suitability.—All of this complex of soils has been cleared, and much of it is used for crops and pasture. Cotton is the main crop, but corn and hay are of considerable importance. Other crops of importance, which are not so extensive, are fall-sown small grains, soybeans, sorghum, and field peas. In many places crimson clover is common as a winter cover crop. Row crops, especially cotton, are fertilized moderately. To get a good stand of alfalfa, it is generally necessary to apply crushed limestone and fertilizer.

Soils of this complex are among the most desirable agricultural soils in the county. They are suited to many crops, especially cotton, soybeans, grain sorghum, deep-rooted legumes such as alfalfa, and other legumes and grasses for hay and pasture. The more eroded areas are not so suitable for corn and truck crops. Such areas are limited in productivity because of poorer tilth and somewhat greater droughtiness.

These soils respond well to proper management and fertilization; high productivity is not difficult to maintain. Moderate rotations are required, however, especially on the more sloping areas. Care is needed to maintain good tilth, where a considerable part of the original surface

Soils of this mapping unit are suitable for crops. Their unfavorable tilth and limited moisture-holding capacity, however, greatly limit the range of crop suitability. Generally, moderately long rotations that consist predominantly of deep-rooted legumes and grasses are best suited. Management that will improve tilth and moisture-holding capacity are especially important. Where feasible, the

lost. On these areas the plow layer consists of dark reddish-brown to red firm to very firm silty clay. There are some small gullies, many of which can be obliterated by using heavy tillage implements.

Soils in this mapping unit are moderately fertile. The content of organic matter is fairly high, although it varies

These soils are suitable for cultivation. Their unfavorable tilth, limited capacity for holding moisture available to plants, rather strong slopes, and susceptibility to erosion if cultivated greatly limit their use, especially for row crops such as corn and cotton. If at all feasible, much of the acreage should be pastured or cropped in long rotations. Rotations should consist chiefly of close-growing crops such as fall-sown small grains, legume cover crops, and legume-and-grass hay or pasture. If fertility is [redacted]

subsoil, and a significant quantity of chert fragments throughout the profile.

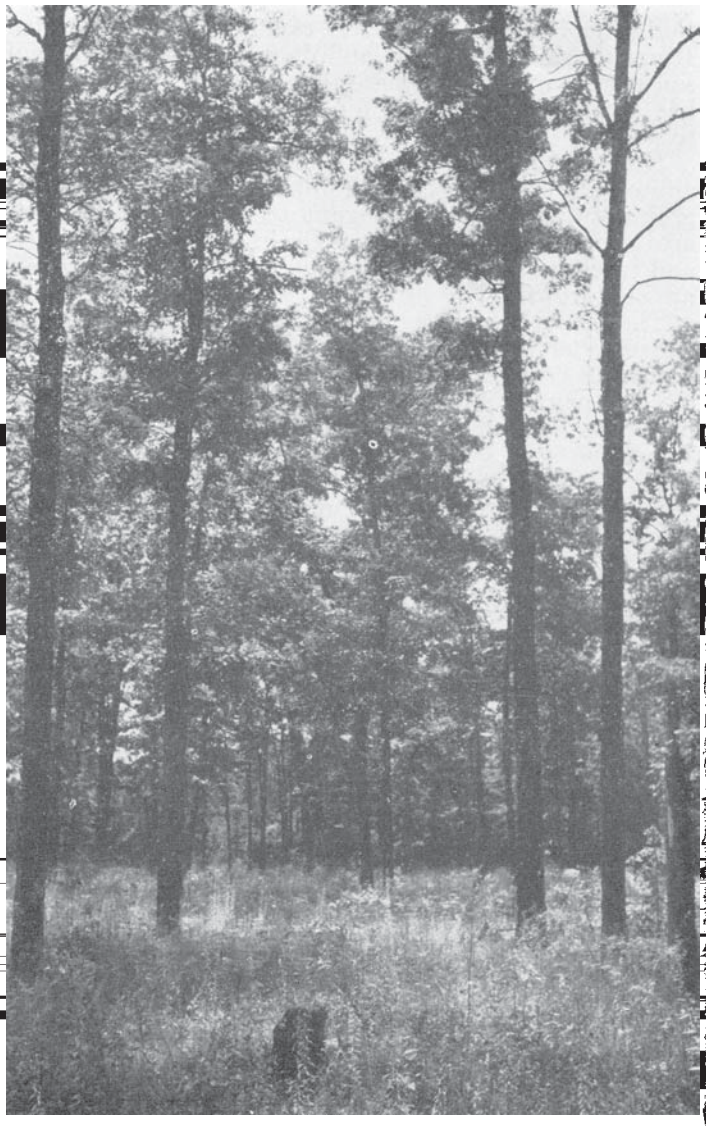
Generally, areas of the eroded undulating phase of Dewey cherty silty clay loam are rather large. They occur in association with the undulating and rolling phases of Baxter, Cookeville, Decatur, and Cumberland soils. Much of the soil is in the Baxter-Cookeville-Dewey soil association, which lies principally north and northeast of Huntsville and extends to the vicinity of Plevna.

[redacted]

kudzu are practical crops. Use and management methods

0 to 7 inches, brown to reddish-brown friable silt loam to silty

If managed properly, the soil is suitable for crops, but only to close-growing small grains and legumes for hay and pasture. Long rotations must be used to keep the soil productive. Most of the acreage is in small tracts associated with smoother more productive soils that are suitable for a wider variety of crops and to much more



tion of moisture is moderately rapid down to the siltpan. Internal drainage is slow, and during the winter the subsoil is excessively wet where the siltpan occurs. The soil has a moderate capacity for holding moisture available to plants.

Use suitability.—Much of this soil is cultivated. Cotton and corn are the chief crops, but some acreage is in small grains and hay. Winter legumes, chiefly crimson clover, are grown to some extent. Grain sorghum, lespedeza, and truck crops, such as tomatoes, melons, and cabbage, are also grown.

The smooth surface, fairly good tilth, and moderate capacity for holding moisture make this soil suitable for numerous crops under moderately intensive management. The impaired internal drainage, however, somewhat limits its suitability. Generally, 3- or 4-year rotations should be used. This soil must be fertilized heavily in order to make it highly productive. Use and management methods are discussed under group 5 in the section Use and Management of Soils.

Dickson silt loam, level phase (0 to 2 percent slopes) (Ds).—In general the surface layer is slightly thicker and the thickness is more uniform for this phase than for the undulating phase. Usually, internal drainage is somewhat slower. Individual areas of this soil are moderately large and occur in association with other Dickson soils and with Lawrence silt loam.

The 12- to 14-inch surface layer is light brownish-gray friable soft silt loam that grades to yellowish brown. The subsoil is yellowish-brown to brownish-yellow friable to moderately firm light silty clay loam, faintly mottled with gray in places. The siltpan, although not present in all areas, is more uniformly developed than in the undulating phases. It occurs at depths of 22 to 26 inches. This layer is a mottled yellowish-brown, yellowish-red, gray, and reddish-brown firm silty clay loam that is compact and brittle in place but friable if crushed when moist. The soil below about 44 inches is gray very firm cherty clay mottled with brownish yellow and yellowish red. Cherty limestone bedrock is at depths of 15 to 40 feet.

This soil, like the undulating phase, is very low in plant nutrients and organic matter and is medium to strongly suitable for grain sorghum, soybeans, and legumes and grasses for hay and pasture. This soil holds plant nutrients fairly well and is not subject to erosion. It therefore can be used intensively if adequately fertilized and otherwise well managed. Use and management are discussed under group 5 in the section Use and Management of Soils.

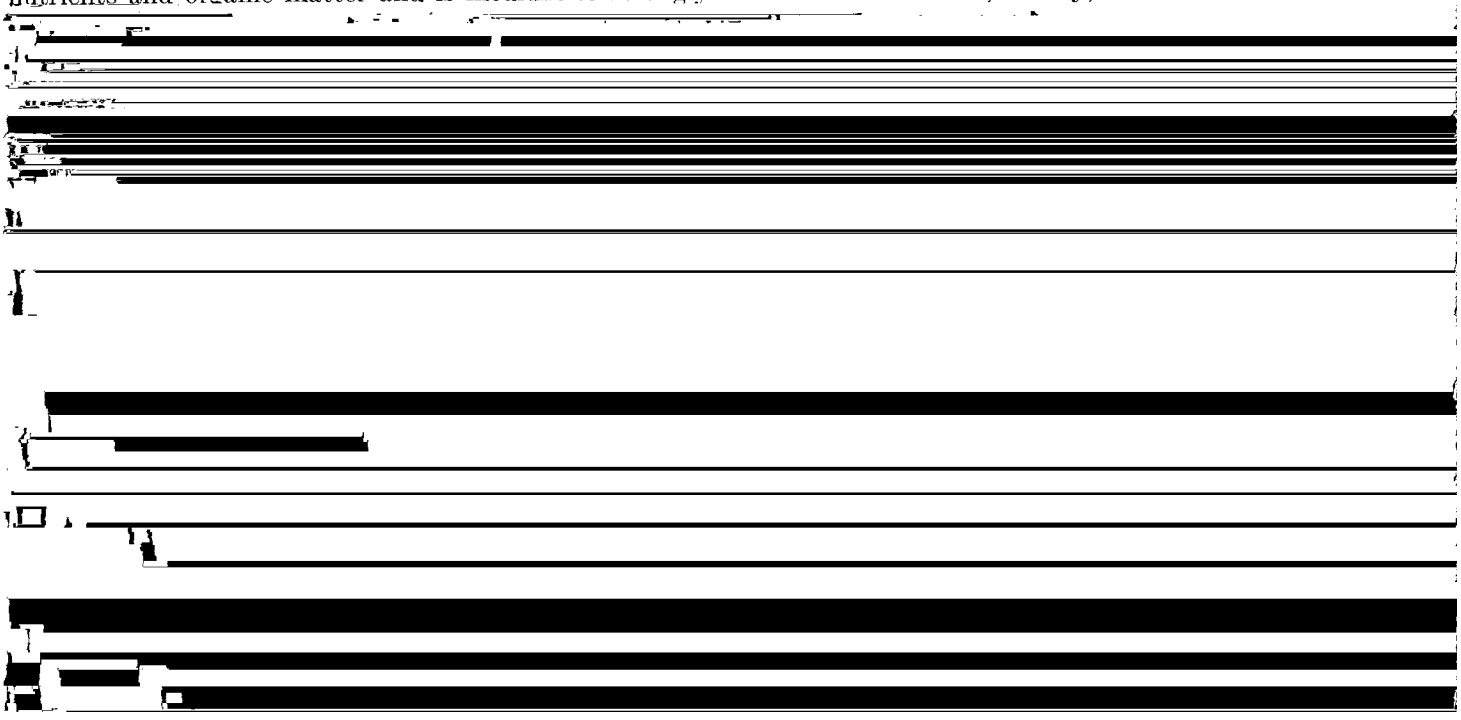
Dickson cherty silt loam, undulating phase (2 to 6 percent slopes) (Dn).—Chert fragments in the plow layer and upper subsoil of this phase interfere materially with cultivation. Most of this soil is in the northwestern quarter of the county in the Dickson-Lawrence soil association.

The 10- to 12-inch surface layer is light brownish-gray cherty silt loam that grades to yellowish brown. The subsoil, to about 26 inches, is yellowish-brown friable to moderately firm cherty silty clay loam, moderately sticky when wet. If moisture is favorable, it breaks easily to fairly well defined medium subangular blocky fragments.

From depths of about 26 to 44 inches, the soil is mottled yellowish-brown, yellowish-red, gray, and reddish-brown firm cherty silty clay loam. In places this layer is a compact and brittle siltpan that breaks easily to rather fine angular pieces if moderately moist. The underlying material is gray and brownish-yellow very firm or tight cherty clay with some yellowish-red mottles. Cherty or very cherty limestone bedrock is at depths of 15 to 40 feet.

The soil is low in plant nutrients and organic matter. It is medium to strongly acid. Except where the siltpan layer is well developed, moisture and roots penetrate easily. In siltpan areas, however, internal drainage is slow and root penetration is greatly restricted.

The capacity of this soil to hold moisture available to plants is high down to the siltpan. During the winter, in areas where the siltpan occurs, percolation of moisture is restrained, and as a result the upper layers become waterlogged. In the spring excess moisture remains longer in this soil than in the Decatur, Dewey, Cookeville, and other soils that have moderate internal drainage. Consequently, this is a cold soil, and, in general, spring field work is delayed from a week to 10 days longer than on soils of the Decatur, Dewey, and Cookeville series.



Dickson soils and with soils of the Lawrence, Baxter, and Bodine series.

On much of the acreage, the 4- to 5-inch plow layer is light brownish-gray to light yellowish-brown cherty silt loam that is a mixture of the original surface soil and subsoil. The subsoil is yellowish-brown cherty silty clay loam. The mottled firm cherty silty clay underlying material occurs at a depth of about 26 inches. Limestone bedrock is at depths of 15 to 40 feet. A few patches on the stronger slopes have lost much of the original surface soil through erosion, and here the plow layer is yellowish-brown firm cherty silty clay loam.

This soil is low in plant nutrients and organic matter

moisture available to plants is moderately high. During the winter the siltpan in some areas causes the subsoil to waterlog.

Use suitability.—About 25 percent of this soil has been cleared and was once cropped. The rest is under cutover native forest. Very little of the soil has been improved for pasture. Common lespedeza is one of the most important pasture plants, but the stand is usually not luxuriant. Cotton, corn, and lespedeza are the principal crops. Irish potatoes, melons, tomatoes, soybeans, cowpeas, and some sorghum for sirup are grown. Yields generally are not high.

This soil is suitable for

Terraces may be practical for some areas. The soil is capable of supporting good pasture if fertilized and properly seeded. Use and management are discussed

soil is much better suited to small grains and cotton. This soil is fairly good for pasture, but the grazing season is

Most areas are along the Tennessee River, although some are along the Flint and Paint Rock Rivers. Generally, the areas along the Tennessee River lie slightly below and adjacent to a strip of Bruno loamy fine sand that adjoins the river channel. On their opposite side are usually strips of Melvin and Lindside soils.

Profile description:

0 to 8 inches, dark-brown to very dark grayish-brown silty clay loam; firm in place but breaks easily to a loose mass of soft crumbs.

8 to 24 inches, very dark grayish-brown silty clay that is moderately friable under optimum moisture conditions and breaks quite easily to sharply angular fine fragments or granules less than one-fourth inch in diameter.

24 to 44 inches, dark grayish-brown to dark yellowish-brown firm to very firm silty clay, usually faintly mottled; depth to limestone bedrock widely variable but in most places it is 6 feet or more

In some areas these chert beds are a source of road-building material, and some gravel pits are operated. Usually the soil is somewhat mottled below a depth of about 28 inches; in a few places mottling is quite pronounced.

This is a fertile soil, although not so fertile as Huntington silt loam. It has a moderate content of organic matter and is medium acid. The surface layer has good tilth, and the entire soil is permeable to roots and moisture. The soil has a high capacity for holding moisture available to plants. Because of its position on bottom lands, it is subject to overflow. Consequently, it cannot be cultivated so early in the spring as many of the upland soils.

Use suitability.—Practically all of this soil is in crops or pasture. Corn is grown on approximately 60 percent of the acreage. Soybeans and lespedeza for hay are next in

fertilizer is used, especially for row crops; cotton generally receives moderate to high applications. Commonly, winter-legume cover crops are turned under for corn, and a sidedressing of nitrate of soda is applied.

This is one of the most desirable soils of the county for crops and pasture. It has good tilth and high fertility. It is not particularly subject to erosion, and it responds well to good management. It is suited to practically all crops commonly grown, including alfalfa and cotton. If properly fertilized and seeded, it will support the most desirable legumes and grasses for hay and pasture. Use and management are discussed under group 2 in the section Use and Management of Soils.

Etowah silty clay loam, eroded undulating phase (2 to 6 percent slopes) (Ey).—The plow layer of this eroded soil consists of a mixture of surface soil and subsoil. The soil occupies the medium-high terraces along the larger streams, mainly the Paint Rock, Flint, and Tennessee Rivers.

The 5- to 6-inch plow layer is brown silty clay loam. The subsoil grades to yellowish-red firm silty clay loam or silty clay that becomes finer and heavier with depth. [redacted]

landscape in which it occurs is generally smooth, and much of the land is suited to cultivated crops.

The 8- to 10-inch surface layer is brown to yellowish-brown friable mellow silt loam. The subsoil is brown to dark yellowish-brown firm but friable silty clay loam. In some areas it is moderately mottled yellowish-brown, brownish-gray, and brown firm silty clay loam below about 30 inches. Limestone bedrock usually occurs at depths of 4 to 20 feet.

This soil is fertile and has a moderately high content of organic matter. It is medium acid. The surface layer has good tilth, and the soil is permeable to both roots and moisture. Internal drainage is medium. The soil has a relatively high capacity for holding moisture available to plants.

Use suitability.—Practically all of this soil, except the acreage within the arsenal areas south of Huntsville, is used for crops and pasture. Cotton, corn, and hay are the chief crops. They are moderately fertilized. A small part of the soil is pastured. This is one of the most desirable soils of the county for crops and pasture. Its high fertility, good drainage, smooth surface, and good workability make it suitable for intensive use for a number

ment, the less severely eroded acreage can be rebuilt so that it will produce well under moderately long rotations.

If managed carefully, this soil is suited to a fairly wide range of crops, including cotton, corn, small grains, and many of the more desirable legumes and grasses. It is not well suited to truck crops, because of its poor tilth and the unfavorable condition of the plow layer for root crops. Use and management are discussed under group 8 in the section Use and Management of Soils.

Etowah cherty silt loam, undulating phase (0 to 6 percent slopes) (Es).—This phase differs from the undulating phase of Etowah silt loam in having chert throughout the profile. The parent material also differs from that of the undulating phase, because a considerable amount of its alluvium was derived from cherty limestone. Approximately half of this soil is nearly level. Practically all of it occupies positions along the larger streams that have headwaters in the Dickson-Lawrence soil association.

This cherty Etowah soil is distinguished from Humphreys cherty silt loam by its browner surface soil and more reddish subsoil. Furthermore, its parent material is a mixture of materials from cherty limestone and high-grade limestone, whereas the parent material of the Humphreys soils is mainly old general alluvium over cherty limestone.

Profile description:

0 to 7 inches, brown to reddish-brown cherty silt loam.
7 to 15 inches, dark reddish-brown friable cherty silt loam that becomes redder with depth.
15 to 30 inches, yellowish-red moderately firm cherty silty clay loam that grades to cherty clay with depth; the chert content generally increases with depth; the lower part of the layer has faint pale-brown and yellowish-brown mottles in many places.
30 to 50 inches, faintly mottled to strongly mottled pale-yellow, yellowish-brown, and yellowish-red moderately

stream terraces. The alluvial parent material came largely from limestone. Enough of it originated from sandstone, however, to make the soil considerably more sandy than the Etowah silt loam soils.

The total acreage is not large, and separate areas are of moderate size. The soil occurs in the limestone valleys along the larger creeks and streams, the headwaters of which arise in sandy soils of the mountains. A large acreage is located south of Keel Mountain and east of Gurley. Many areas are associated with areas of other smooth soils that are suitable for cultivation.

Profile description:

0 to 7 inches, grayish-brown to brown friable loam.
7 to 12 inches, light-brown to reddish-brown friable loam that grades with depth to fine sandy clay loam.
12 to 36 inches, yellowish-red to reddish-brown firm but moderately friable fine sandy clay with fairly well defined moderate blocky structure.
36 to 48 inches, faintly to strongly mottled yellow, brown, red, and gray fine sandy clay; limestone bedrock at depths of 4 to 20 feet.

Most of this soil that occurs in the Paint Rock River valley has a finer textured stiffer or firmer subsoil than is usual for this phase. In a few places, the topmost 4 to 7 inches consists of very loose fine sandy loam and overlies a more compact and firm subsoil.

This is a fertile, strongly acid soil. It has a moderate content of organic matter. The surface layer has very good tilth and is easily worked. Except in a few places where the texture is firm to very firm, the subsoil is permeable to roots and moisture. The capacity for holding moisture available to plants is high, and internal drainage is medium

Use suitability.—Practically all of this soil is used for crops, chiefly cotton, corn, and some hay. Rotations are short and consist largely of row crops. Some fertilizer

moisture. Except in the more eroded patches, its capacity for holding moisture available to plants is high. Internal drainage is medium.

Use suitability.—All of this soil has been cleared, and much of it is used for crops. These are chiefly cotton, cussed under group 2 in the section Use and Management of Soils.

Greendale silt loam (0 to 5 percent slopes) (Gs).—This moderately well drained to well drained light-colored soil occurs on local alluvium. It is associated with the Dick-

age. Use and management are discussed under group 2 in the section Use and Management of Soils.

Greendale cherty silt loam (0 to 5 percent slopes) (GR).—This soil consists of local alluvium. It is distinguished from Greendale silt loam chiefly by the chert fragments that interfere materially with cultivation. Also, it is generally somewhat stronger in slope, lighter colored, lower in organic matter, and usually closer to the source of the soil material. This soil occupies gentle slopes or drainheads and is associated with Dickson, Lawrence, Bodine, and Baxter soils. Much of it is in the Dickson-Lawrence and Baxter-Cookeville-Dewey soil associations.

Profile description:

0 to 8 inches, pale-brown to yellowish-brown cherty silt loam; very gray when dry.

concretions are common throughout the profile; limestone bedrock at depths of 5 to 20 feet or more.

The plow layer may be underlain by mottled gray, yellow, and brown material that contains more silt than is characteristic of the 7- to 30-inch layer. In these places the compact very firm silty clay is at depths of 12 to 15 inches.

This medium to strongly acid soil is low in plant nutrients and organic matter. The surface layer is friable and has good tilth but much of the time is too wet to cultivate. The 7- or 8-inch surface layer is permeable to moisture and roots, but the compact subsoil is very slowly permeable. Internal drainage is slow to very slow. The capacity for holding moisture available to plants is not great, and the period during which moisture is favorable for plant growth is short. In general, the

however, it is medium acid, and in others neutral or slightly alkaline. Drainage is moderately good to somewhat poor. The surface layer has good tilth and works easily to a good seedbed. After wet periods, however, the soil may not become dry enough to till as soon as some of the better drained soils. The soil is permeable to roots and moisture, but internal drainage is slow. Practically all areas are flooded at times.

Use suitability.—Much of this soil is used for crops and pasture. Approximately 60 percent is planted to row crops. Corn is the principal row crop, and soybeans and lespedeza the chief hay crops. Some sorghum is grown for sirup and grain, and a considerable acreage is in pasture, some of which has been improved. Fertilizer is generally not used. Little lime has been applied, mainly because this soil does not need it to grow legumes. Crop yields are moderately high, and pastures are of good quality.

This soil is well suited to intensive use because of the moderately high productivity, smooth surface, good tilth, and high capacity for holding moisture available to plants. Because of slow internal drainage and susceptibility to flooding, it is suited to only a few of the crops commonly grown in the county. It is well suited to corn, soybeans, and sorghum. Some of the better drained areas are suitable for cotton. If properly fertilized and seeded

moderately rapid throughout the entire profile except where the pan is developed; in such places, downward movement of water and development of roots is retarded.

Except in areas where the pan occurs or bedrock interferes, internal drainage is rapid. The capacity for holding moisture available to plants is not high, but the ease with which roots penetrate to the deep subsoil compensates for this to some extent. Moreover, light showers during dry periods are of more benefit to the crops on this sandy soil than to those on the more clayey soils, as more of the moisture penetrates the soil.

Erosion is not a great hazard, because of the smooth or gently sloping surface and the ease with which moisture penetrates. However, control of runoff is necessary on the more sloping areas, especially when the soil is under cultivation.

Use suitability.—All of this soil is under cutover forest that consists mainly of oaks. A few pines are intermixed. The smooth surface, good tilth, and ability to respond quickly to adequate fertilization, however, make this one of the more desirable soils of the county for crops. It is especially well suited to small fruits and truck crops such as potatoes, cabbage, tomatoes, beans, strawberries, and loganberries. It is also well suited to cotton, as it is a warm soil and is easily cultivated. It is moderately well suited to most of the other crops commonly grown in the

legumes and grasses desirable for hay and pasture. In

surface layer, and the soil is permeable to roots and moisture. Internal drainage is rapid. The capacity for

rock. A few areas are on the benches of steep mountain slopes.

The 4-to 5-inch plow layer is light yellowish-brown fine sandy loam that grades to heavy fine sandy loam. The subsoil is predominantly yellowish-brown friable fine sandy loam to fine sandy clay loam. The soil below about 20 inches is weakly to moderately variegated or mottled yellowish brown, pale yellow, and brown. Depth to sandstone bedrock ranges from 1 to 2½ feet. Some sandstone [illegible] on the surface, and rock outcrops occur in

Use suitability.—All of this soil is under cutover deciduous forest. Its suitability for cultivated crops is fairly good but is restricted by its rather strong slope, low fertility, and shallow depth to bedrock. Since the soil is easily eroded when cultivated, many of the more sloping areas should be put in permanent pasture.

If carefully managed, the soil is suited to a wide variety of crops, including corn, cotton, soybeans, sorghum, and many truck crops and small fruits. It is also suited to small grains, hay, and pasture but is not so suitable for

hay and pasture. It responds well to proper fertilization. Its limited capacity for holding moisture and its droughtiness during prolonged dry periods greatly limit its productivity. Methods of use and management are discussed under group 11 in the section Use and Management of Soils.

Hermitage silt loam, undulating phase (2 to 6 percent slopes) (Ho).—Like other Hermitage soils, this is a well-drained red soil that consists of old colluvium or local alluvium, derived largely from high-grade limestone. It occurs on gentle slopes at the foot of steep mountain slopes. In general, it is a part of undulating and rolling landscapes that are largely suitable for cultivated crops. Areas of this soil are usually small and are widely scattered throughout the eastern, northeastern, and central parts of the county.

Profile description:

ment are discussed under group 3 in the section Use and Management of Soils.

Hermitage silt loam, eroded undulating phase (2 to 6 percent slopes) (Hp).—This eroded soil is associated with other Hermitage soils at the base of steep mountain slopes in the limestone valleys.

The 4- to 6-inch plow layer now consists of brown to reddish-brown silt loam that in places grades to silty clay loam. The subsoil is yellowish-red firm silty clay loam that grades with depth to variegated yellowish-red, yellowish-brown, yellowish-gray, and brown very firm silty clay. Limestone bedrock occurs at depths of 4 to 10 feet.

Many areas have a moderate amount of chert throughout the surface layer and subsoil, and in many places the deep subsoil is very cherty silty clay. Practically all of the surface soil has been lost in a few areas, and the plow layer consists of yellowish-red firm silty clay loam.

A considerable amount of this soil is so eroded that practically all of the original surface soil has been lost; the plow layer now consists of yellowish-red firm to very firm silty clay. In such areas there may be some shallow gullies or occasional deeper ones, most of which are in-

Some patches, especially on the stronger slopes, have lost practically all of the original surface soil, and the plow layer consists of yellowish-red cherty silty clay loam or cherty silty clay. In many places the larger chert fragments make up a great part of the subsoil below a

Use suitability.—All of this soil is under cutover native deciduous forest, chiefly oaks and hickories. A few pines and cedars are intermixed. It can be cropped, but the chert content and the rather strong slope considerably limit its suitability for crops. It is suitable for cotton, corn, and most of the more desirable legumes and grasses for hay and pasture, but moderately long rotations must be used. The soil is responsive, and its productivity can be made fairly high. Methods of use and management are discussed in group 9 in the section Use and Management of Soils.

Hermitage cherty silt loam, eroded rolling phase (6 to 12 percent slopes) (HL).—This eroded rolling soil is the most extensive of the Hermitage soils and is widely distributed throughout the Hermitage-Talbott-Colbert soil association. Most of it occupies positions adjacent to and directly

potatoes, and sorghum. Much of the soil is tilled on the contour. Row crops are commonly fertilized.

The range of crops that can be grown on this soil is limited by rather strong slopes and chertiness. The soil, however, is well suited to most of the general farm crops. It responds well to proper management and to moderately long rotations, and productivity can be maintained at a fairly high level. It is not suitable for truck crops, chiefly because of the chert and the shallow depth to the very firm clayey subsoil. Like the other Hermitage soils, it will support good pasture, although on the more eroded parts the moisture supply is restricted during the drier parts of the growing season. Methods of use and management are discussed in group 9 in the section Use and Management of Soils.

Hermitage cherty silty clay loam, severely eroded roll-

On a small acreage that has not been eroded, the 8-inch surface layer is grayish-brown cherty silt loam. In contrast, a considerable acreage on the stronger slopes has lost practically all of the original surface soil and in places part of the subsoil through erosion. On these areas the plow layer consists of yellowish-red firm to very firm cherty silty clay. The amount of chert varies; in some places it is so abundant that tillage is very difficult; in other places, although not so abundant, it is sufficient to interfere with field work. A few limestone outcrops occur.

Some characteristics of Hermitage cherty silt loam, eroded hilly phase, vary according to degree of erosion. In the less eroded areas, the supply of organic matter is fair and the soil is moderately fertile, permeability is moderate to moderately rapid, and the capacity for holding moisture available to plants is moderately high. On the other hand, the more eroded areas have little organic matter, slow permeability, and rather low moisture-holding capacity. Internal drainage of this eroded hilly phase is medium.

Use suitability.—Except for a very small acreage, all of this soil has been cropped at some time. Much of the soil is in unimproved pasture. Lespedeza and Dallisgrass are among the more common of the volunteer legumes and grasses that afford grazing. Only a small part of this soil is cropped. Corn is the chief crop, but some cotton, soybeans, and cowpeas are also grown. Crop yields in general are low. Little fertilizer is used. A few farmers raise corn for 2 or 3 years and follow it with voluntary pasture. Corn is usually not fertilized extensively, but cotton, if it follows the corn, is fertilized at a moderate rate. The uncleared areas of this soil are covered by cutover forest, chiefly oak and hickory. Some pines and cedars are intermixed. A small acreage, once cleared, has reverted to forest that is chiefly pine, locust, persimmon, and sassafras.

Chiefly because of the strong slope, chertiness, and, in places, severe erosion, this soil is not well suited to cultivated crops. It affords a fair amount of grazing if the fertility is brought to a high level and the soil is properly seeded. The least eroded areas have sufficient moisture for considerable grazing. On the more severely eroded areas, grazing is restricted because of the small amount of moisture available to plants. Methods of use and management are discussed under group 13 in the section Use and Management of Soils.

Hollywood silty clay (0 to 2 percent slopes) (Hr).—This is the darkest colored soil in the county. Often it is referred to as black clay land. It is on very gentle

Profile description:

0 to 5 inches, dark grayish-brown firm silty clay moderately friable under optimum moisture but plastic when wet and hard when dry.
5 to 20 inches, olive-tinted very dark gray silty clay or very firm clay; a few faint mottlings; the mass breaks to small angular fragments under optimum moisture but is very plastic when wet and very hard when dry.
20 to 36 inches+, very dark gray very firm clay, mottled with brown and yellowish red; very plastic when wet and very hard when dry; limestone bedrock occurs at depths of 1 to 5 feet.

Occasional limestone outcrops occur, and in areas shallowest to bedrock the soil material may be residual from the underlying rock. In the higher lying, better drained areas, the surface soil is lighter colored and the subsoil more yellowish. In the lowest lying areas, such as those along the drainageways, the surface soil is darker and the subsoil grayer and thicker.

Hollywood silty clay is high in plant nutrients and fairly high in organic matter. It is slightly acid to slightly alkaline. Tilth of the plow layer is fairly good under optimum moisture. The range of optimum moisture is very narrow, however, and the soil is difficult to work when a little too wet or too dry. Permeability and internal drainage are slow. Usually the slope is sufficient to remove excess runoff except in a few places. Erosion is not a serious hazard.

Use suitability.—Most of this acreage has been cleared and used for crops (fig. 9). At present much of it is in permanent pasture or is in such crops as corn, soybeans, and grain sorghum. Small grains, chiefly wheat, oats, and rye, are grown to some extent.

The high fertility and smooth surface make this soil favorable for crop production, but its clayey texture and slow internal drainage limit the number of crops to which it is suited. Hay and pasture and, to a less extent, small grains are among the better suited crops. Although cotton and corn produce fairly well, they are harder to till on this soil than on some of the more friable well-drained soils. Use and management methods are discussed under group 6 in the section Use and Management of Soils.

Hollywood silty clay, eroded undulating phase (2 to 4 heavy applications of fertilizer are necessary. The soil

of about 24 inches is light yellowish-brown to yellow firm fine sandy clay loam, faintly mottled with gray in the lower part. The underlying material is mottled yellowish-gray, yellowish-red, and reddish-brown firm to very firm fine sandy clay. Limestone bedrock is at depths of 3 to 15 feet.

Surface runoff is slow, and permeability is moderate. The soil has a high capacity for holding moisture available to plants. Tilth of the plow layer is good. This soil is moderately low in fertility and organic-matter content. It is medium to strongly acid.

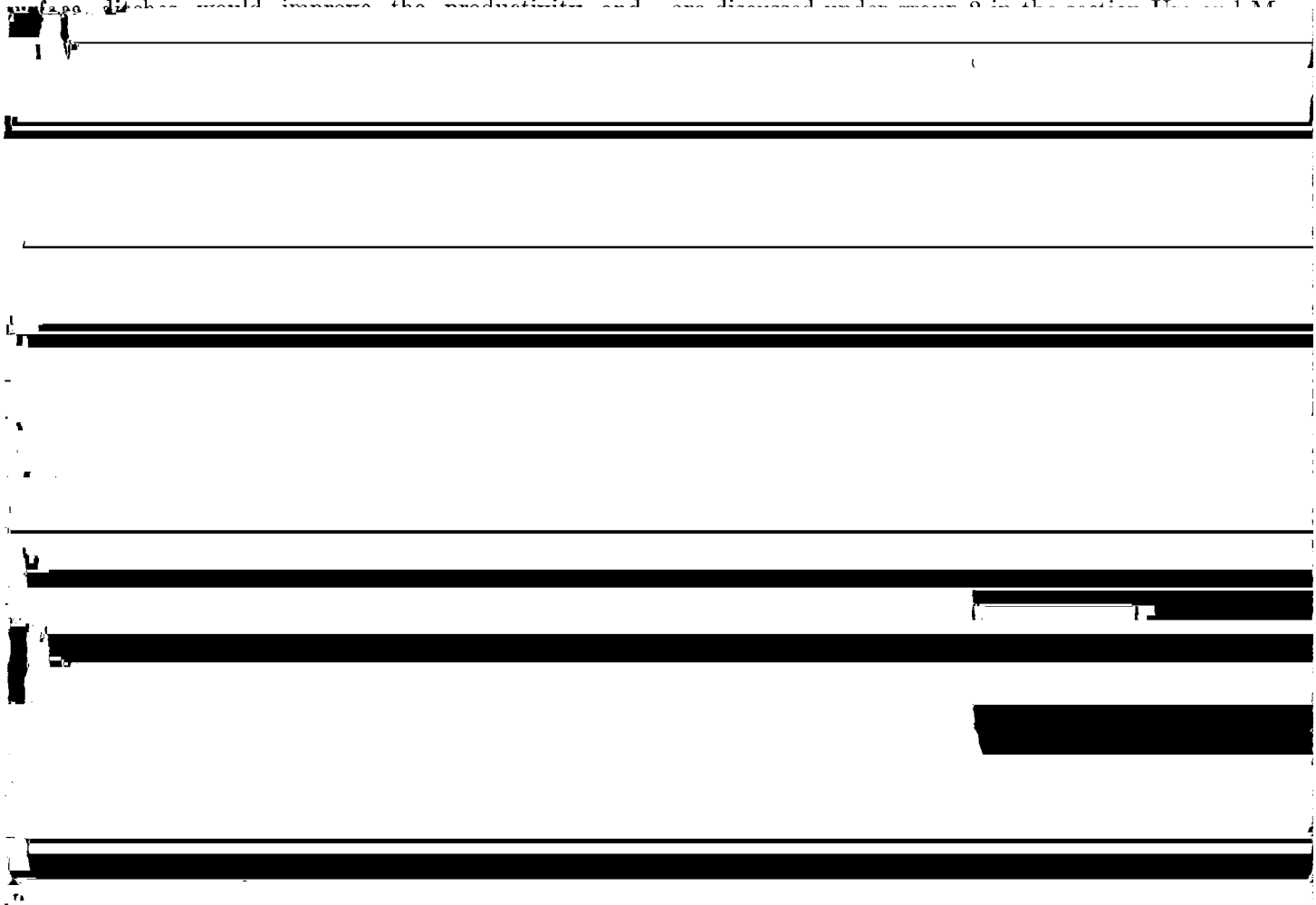
Use suitability.—Most of the acreage is cultivated. Corn, soybeans, and grain sorghum are among the chief crops. Some hay is grown. Other common crops are potatoes, sweetpotatoes, truck and berry crops, and sorghum for sirup. Only a small acreage is planted to cotton.

This soil is easily worked and conserved. It is suitable for a number of crops, including corn, small grains, most of the more desirable legumes and grasses for hay and pasture, and many truck crops. Its slow internal drainage and slow runoff cause it to warm slowly in the spring. Therefore, it is not so favorable for cotton as some of the better drained higher lying soils. It responds well to good management and is especially favorable for crops that need a great deal of moisture during the drier part of the growing season. Erosion is not a hazard. If feasible to install, artificial drainage would improve much of the soil for general agricultural use. In most areas shallow surface ditches would improve the productivity and

areas closely associated with the Dickson soils and considerably higher in those associated with the Baxter, Cookeville, and Dewey soils. The soil is medium to strongly acid. The surface layer has good tilth, and the soil can be worked over a wide moisture range. Internal drainage is moderate to moderately slow, and runoff is medium. The soil has a high capacity for holding moisture available to plants. Runoff water is not a great hazard, except in a few areas of stronger slope.

Use suitability.—Most of this soil has been cleared. Corn, soybeans, lespedeza, and sorghum are among the most common field crops. Some cotton is grown, but the soil is not so well suited to it as are some of the better drained soils. Yields in general are moderately high, but they depend largely upon the amount of fertilizer that is added.

The smooth surface, favorable tilth, ability of the soil to respond to good management, and the abundant moisture held available to plants, make this a desirable soil for agricultural use. It is suited to a number of crops, including corn, small grains, and most of the more desirable legumes and grasses for hay and pasture. It is also suited to certain truck crops, such as cabbage, tomatoes, green beans, and melons. Its somewhat impaired drainage delays tillage at times. For this reason it is not so well suited to early spring crops and cotton. It is suitable for permanent pasture because during the drier parts of the growing season its moisture supply is greater than in the higher lying better drained soils. Use and management are discussed under group 2 in the section Use and M



is cultivated and the rest is used mainly for pasture. Cotton, corn, and soybeans are the chief crops.

Although this soil is suitable for crops, the chert content makes it hard to work and unsuitable for crops that require mowing. The most cherty areas have limited suitability for crops and pasture because they are droughty and lack fertility. Row crops can be grown intensively on most areas, as erosion is not a great hazard. Use and management are discussed under group 2 in the section Use and Management of Soils.

Huntington silt loam (0 to 4 percent slopes) (Hz).—This is a well-drained, brown, permeable soil on bottom lands. It was derived mainly from limestone material that was intermixed with some material from sandstone and shale. This soil is more extensive than Huntington fine sandy loam and is free of sand.

Practically all of Huntington silt loam occurs along the larger streams in the southern part of the county. The

rains, delays cultivation. Among the best suited crops are corn, soybeans, sorghum, and, except possibly alfalfa, practically all the legumes and grasses for hay and pasture. Although this is one of the most fertile soils in the county, it responds well to fertilization. Use and management are discussed under group 1 in the section on Use and Management of Soils.

Huntington fine sandy loam (0 to 2 percent slopes) (Hy).—This soil is more sandy than Huntington silt loam. It is a brown well-drained soil that consists of mixed general alluvium strongly influenced by limestone material. In Madison County this soil is a mixture of sandstone, shale, and limestone residuum. Most of it occupies bottom lands along the larger streams in the southern part of the county. It is most extensive along the Tennessee, Flint, and Paint Rock Rivers, and along Huntsville Spring Branch. Most of the acreage lies in very gently undulating strips adjacent to stream channels. Practically

some material from shale and limestone is intermixed. Practically all of this soil is in the Allen-Jefferson soil association, which lies as strips at the base of some of the steep stony mountain slopes.

Profile description:

0 to 10 inches, pale-brown very friable fine sandy loam.
10 to 26 inches—yellowish-brown friable but firm fine sandy clay

eroded areas, the plow layer has good tilth. The soil is generally permeable to both roots and moisture. Internal drainage is medium, and the capacity for holding moisture available to plants is fair. In a few small patches on the lower slopes, seepage water impairs internal drainage to some extent. Runoff develops rather rapidly because of the slope and causes erosion if the soil is cultivated

This soil is fairly well suited to crops that need tillage. However, its moderately strong slope and low fertility limit its range of suitability. It is suitable for many crops, including corn, cotton, small grains, a wide variety of legumes and grasses for hay, and some truck crops. Row crops should not be grown frequently. They can be grown, however, in rotations of moderate length if close-growing crops predominate. The soil in general is responsive to good management, and much of the acreage can be made fairly productive. Methods of use and management are discussed under group 11 in the section Use and Management of Soils.

Jefferson stony fine sandy loam, eroded rolling phase (6 to 12 percent slopes) (JH).—This soil differs from Jefferson fine sandy loam, undulating phase, mainly in having a stronger slope, enough stones in the surface layer to interfere with cultivation, and a significant loss of original surface soil through erosion. Like the other Jefferson soils, this phase consists of old local alluvium and colluvium derived largely from sandstone. Some material from limestone and shale is intermixed.

Practically all of this soil is in the Allen-Jefferson soil association, south and east of Huntsville. Most areas are closely associated with the smoother, less stony Jefferson soils.

The 4- to 5-inch plow layer, which consists of a mixture of the original surface soil and subsoil, is predominantly brownish-yellow stony fine sandy loam. The subsoil is yellowish-brown stony moderately firm but friable fine sandy clay loam. It grades with depth to moderately splotched or mottled yellow, yellowish-gray, and brown firm fine sandy clay loam. Limestone bedrock occurs at moderate length or long if the soil is to be kept productive. Methods of use and management are discussed under group 11 in the section Use and Management of Soils.

Lawrence silt loam (0 to 2 percent slopes) (LA).—This is a somewhat poorly drained yellowish soil developed over cherty limestone. It occurs in slight depressions, practically all of which have inadequate outlets for surface drainage. Surface runoff is therefore very slow. This soil is associated with Dickson soils in the Dickson-Lawrence soil association in the northwestern part of the county. The separate areas are moderately large and are part of more extensive areas of smooth soils that are suitable for cultivation.

Profile description:

0 to 12 inches, light yellowish-brown to pale-brown friable silt loam that crumbles easily to a mellow mass; in uncultivated areas the surface 1 inch or so is a little darker and contains some partly decomposed roots and leaves.
12 to 24 inches, brownish-yellow friable but firm silty clay loam mottled with light gray and yellowish brown.
24 to 36 inches, strongly mottled light-brown, yellowish-red, and light brownish-gray very firm brittle silty clay; compact in place but forms a fairly friable mass when crushed: commonly known as a pan: Cherty limestone bedrock is at depths of 15 to 40 feet.

Thickness of the soil layers above the pan ranges from 18 to 26 inches. In most areas this soil is free of chert to a depth of 30 to 36 inches and the silty surface resembles loessal, or windblown, material.

Lawrence silt loam is low in content of plant nutrients and organic matter and is medium to strongly acid. The more friable material in the topmost 18 to 30 inches is permeable to roots and moisture, but the compact pan

Melvin silty clay loam, however, in consisting of young general alluvium derived from low-grade cherty limestone. In contrast, the Melvin soil consists of general alluvium derived mainly from high-grade limestone.

Lee silt loam occurs on low bottom lands along streams that originated in the cherty limestone area in the northwestern part of the county that is occupied by the Dickson-Lawrence soil association. Along the larger creeks, it is associated with Ennis and Humphreys soils. Because of its position, it is the first soil of the bottom lands to

can be cultivated under a somewhat wider moisture range. These soils are permeable to roots and moisture, but the poor drainage, especially of the Lee soil, greatly inhibits root development.

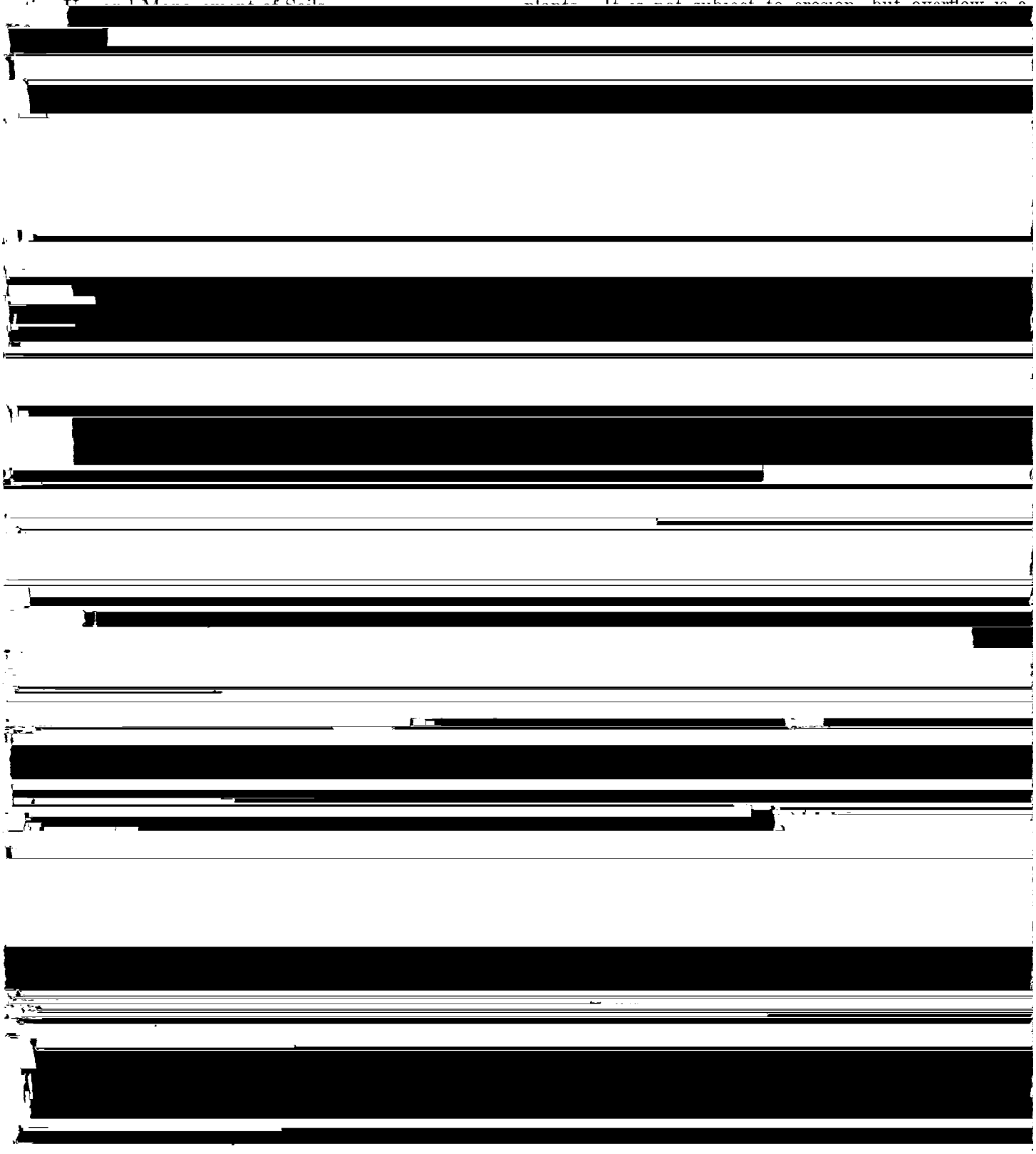
Use suitability.—Much of this acreage is still under native forest, chiefly deciduous trees. A small part is cleared and is pastured. Little is used for crops.

Without artificial drainage, these soils are too poorly drained to be suitable for crops. Areas on which drainage

small part of this acreage is cultivated at the present time. The rest is pastured.

This soil is not well suited to cultivated crops. Much of the acreage, however, is fairly well suited to pasture if adequate amounts of fertilizer are used, and if the soil is properly seeded. Some of the more cherty, less well drained areas are best used for forest. Methods of use and management are discussed under group 14 in the

of the plow layer is fairly good. The slow internal drainage, however, causes the soil to be too wet for field work for a considerable time following wet periods. During much of the growing season, the soil is permeable to roots and moisture to depths of 20 to 35 inches. During the wetter periods, however, the water table is so near the surface that root development is greatly impaired. The soil has a high capacity for holding moisture available to

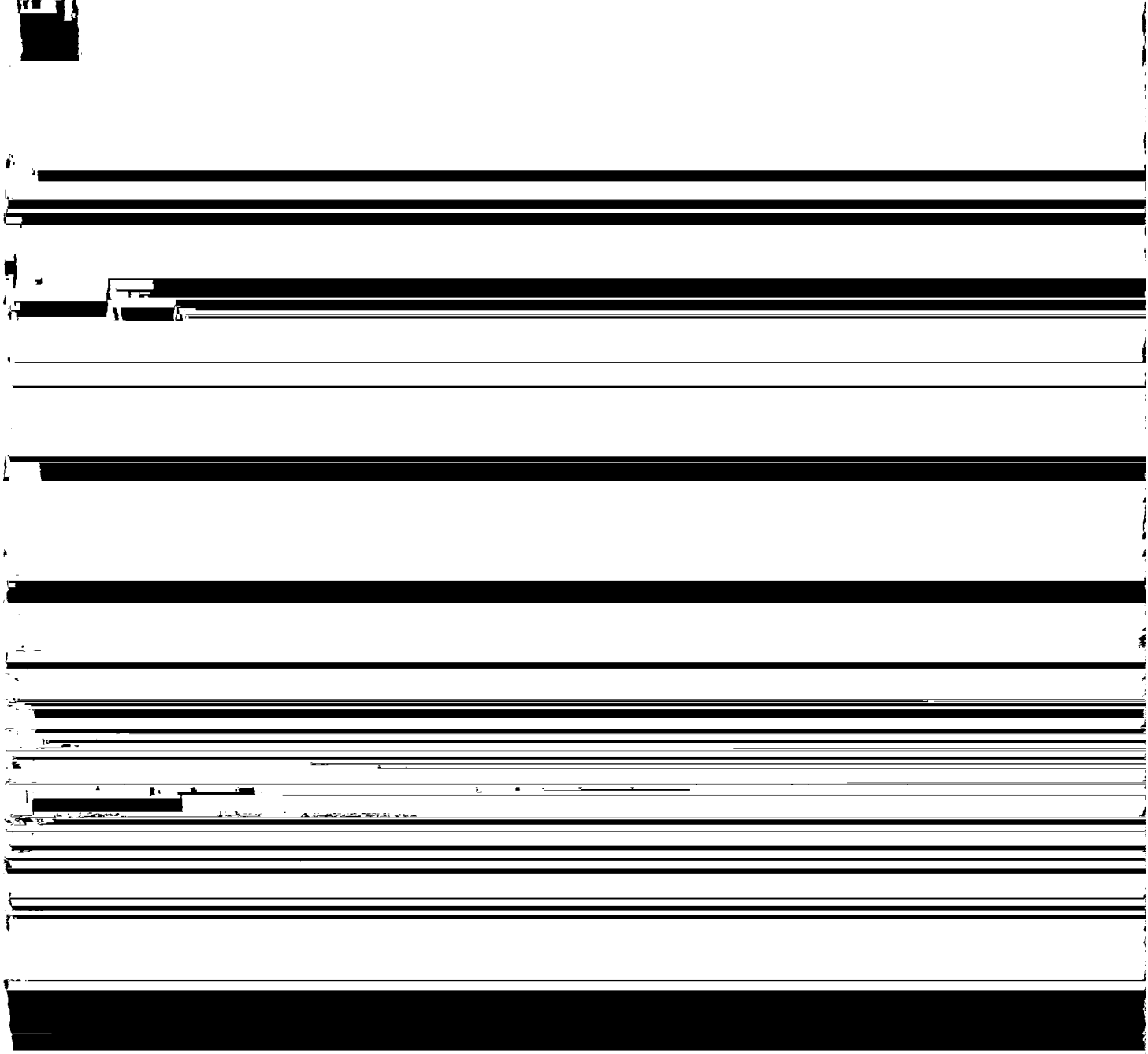


The soil is permeable to both roots and moisture. Internal drainage is moderate to rapid, and, in general, drainage is somewhat excessive. The soil has a moderate capacity for holding moisture available to plants. Erosion is a hazard on the more sloping areas.

Use suitability.—Practically all of this soil has been used for [redacted] at some time. Much of it is cropped at

permeable to roots and moisture, and the water table is near the surface much of the time. Runoff water is removed slowly because surface drainage is not developed.

Use suitability.—Much of this soil is under native forest consisting of water-tolerant species, a great many of which are oaks. Other fairly common trees are cedar, holly, and swamp pine. A few magnolia trees occur. Some land



of the small acreage that is still under forest is used as woodland pasture. Corn, grain sorghum, soybeans, and common lespedeza are the chief crops grown on the cultivated acreage.

The number of suitable crops is restricted on this soil because of its impaired drainage. It is a cold soil, and field work is greatly delayed following wet periods. Among the better suited crops are corn, soybeans, grain sorghum, cotton, truck crops, and moisture-tolerant legumes and grasses. The areas in which drainage has been improved are suited to cotton and truck crops. Additional areas can be much improved for agricultural use by installing shallow ditches to remove excess runoff. This has been done in a few areas. Where drainage has been improved, the soil responds well to proper fertilization. It is productive of corn, sorghum, small grains, soybeans and most of the legumes and grasses for hay and pasture, and some truck crops. Generally, it is not suitable for alfalfa, and it is much less suitable for cotton than are some of the higher, better drained soils. Use and management are discussed under group 6 in the section Use and Management of Soils.

Muskingum fine sandy loam, hilly phase (10 to 20 percent slopes) (Mu).—Like other soils of the Muskingum series in Madison County this soil is well drained to excessively drained and shallow to bedrock sandstone. In general, it occupies positions on strong slopes along the upper reaches of drains. These drains extend into the ridgelands of mountain areas in the eastern part of the county. Areas of this soil lie above the steep stony mountain slopes and directly below the Hartsells soils that occupy the smooth parts of the ridgetops. In many respects Muskingum fine sandy loam, hilly phase, is similar to the shallow phases of the Hartsells soils. It differs from them chiefly in having hilly or stronger slopes and a somewhat shallower depth to bedrock sandstone. Although most of the Muskingum soils have a considerable amount of loose stone and some rock outcrops, this phase is for the most part free of loose stone. It is not an extensive soil.

Profile description:

0 to 5 inches, grayish-brown to light yellowish-brown loose fine sandy loam.
5 to 20 inches, light yellowish-brown friable light fine sandy clay loam that breaks to weak fragments; lower part is somewhat variegated or splotched with gray and contains partly disintegrated sandstone fragments; sandstone bedrock is at depths of 1 to 3 feet.

In those few areas that have been cultivated at some time, the surface layer is light yellowish-brown heavy fine sandy loam. A few loose stones occur on the surface in places, and there may be an occasional rock outcrop.

Muskingum fine sandy loam, hilly phase, is low in plant nutrients and organic matter. It is medium to strongly acid. The surface layer has good tilth and works easily to a good seedbed. The soil is permeable to roots and moisture, and internal drainage is rapid. Surface runoff is rapid. Seepage spots are fairly common, especially on the lower edges of the longer slopes, but are generally evident only during the wettest periods.

Use suitability.—Most of this soil is under cutover native deciduous forest. Some pine is intermixed. The areas that have been cleared at some time now have almost pure stands of pine. Practically none of the acreage is now cultivated.

This soil is poorly suited to tilled crops because of its strong slopes and shallow depth to bedrock. It affords fairly good grazing if adequate fertilizer is applied and if it is properly seeded. Most of the acreage, however, is so inaccessible that its best use is for forest. Methods of use and management are discussed under group 13 in the section Use and Management of Soils.

Muskingum stony fine sandy loam, hilly phase (10 to 20 percent slopes) (Mv).—A considerable amount of loose stones and some rock outcrops characterize this soil. It consists of residuum from sandstone and conglomerate. Practically all of it lies above the steep stony mountain slopes along the upper reaches of drains that extend into the ridgelands of the smooth mountaintops.

The 4- to 5-inch surface layer is grayish-brown to light yellowish-brown stony loose fine sandy loam. The subsoil is light yellowish-brown friable light fine sandy clay loam that contains numerous sandstone fragments throughout. Bedrock may be at the surface or at depths not exceeding 2½ feet.

This soil is low in content of plant nutrients and organic matter and is medium to strongly acid. Although it is friable and has good tilth, the rock fragments and the shallow depth to bedrock interfere greatly with tillage. Moisture and roots penetrate the soil easily. Internal drainage is medium to rapid, and runoff is rapid. The capacity for holding moisture available to plants is low because the soil is shallow.

Use suitability.—Most of this soil is under cutover native deciduous forest. Some pine is intermixed. Because of stoniness, the soil is unsuitable for tilled crops. Some areas are suitable for pasture. Much of the acreage, however, is not easily accessible and is therefore best used for forest. Methods of use and management are discussed under group 15a in the section Use and Management of Soils.

Muskingum stony fine sandy loam, steep phase (20 to 45 percent slopes) (Mw).—A stronger slope, usually a shallower depth to bedrock, and extensive loose stones and rock outcrops differentiate this soil from the hilly phase of Muskingum stony fine sandy loam. Areas of this steep phase lie above the steep stony mountain slopes. They are adjacent to and below the smoother Hartsells soils that occupy the mountain ridgetops. Much of their acreage is along the upper reaches of drainageways that extend into the smooth ridgeland areas of the mountains.

The surface 4 or 5 inches is grayish-brown or light yellowish-brown loose fine sandy loam in which a great many loose sandstone fragments are intermixed. The subsoil is light yellowish-brown friable fine sandy loam to fine sandy clay loam. Bedrock is at the surface or may be as deep as 2½ feet.

This medium to strongly acid soil is low in plant nutrients and organic matter. It is permeable to roots and moisture, and it has good tilth, but the numerous stones make tillage impractical. Both internal drainage and runoff are rapid. The capacity for holding moisture available to plants is low.

Use suitability.—Practically all of this soil is under cutover native deciduous forest; most of the small areas that were once cleared have now reverted to pine forest.

The strong slope and shallow depth to bedrock make this soil poorly suited to either crops or pasture. Consequently, practically all of it can best be used for forest. Methods of use and management are discussed under group 15a in the section Use and Management of Soils.

Ooltewah silt loam (0 to 2 percent slopes) (Op).—This is a brownish somewhat poorly drained to moderately

well drained soil. It consists of local alluvium washed from soils developed over high-grade limestone and from soils on the stream terraces derived mainly from limestone.

This soil occurs in gentle depressions in association with brown or reddish-brown well-drained soils. Some areas are in closed depressions and have no outlet for surface drainage. Others are along gentle drainageways, and a few are on very gentle valley slopes adjacent to bottom lands. The separate areas are not large. Most of them are less than 10 acres in size, but a few are from 50 to 60 acres. They are widely distributed throughout the central and southern parts of the county, especially in the Decatur-Cumberland-Abernathy, the Hermitage-Talbott-Colbert, and the Holston-Tupelo-Robertsville soil associations. Much of the acreage is temporarily flooded when wet periods are prolonged.

Profile description:

0 to 8 inches, brown to reddish-brown friable silt loam.
8 to 16 inches, brown friable silty clay loam faintly mottled with reddish yellow and yellowish gray.
16 to 36 inches, mottled yellow, gray, and brown friable to moderately firm silt loam or silty clay loam; limestone bedrock occurs at depths of more than 6 feet.

The thickness of the local or recent alluvium varies. In some places it is several feet thick, but in others firm to very firm residual silty clay occurs at depths ranging from 36 inches to 5 or 6 feet. In some places the 8- to 12-inch

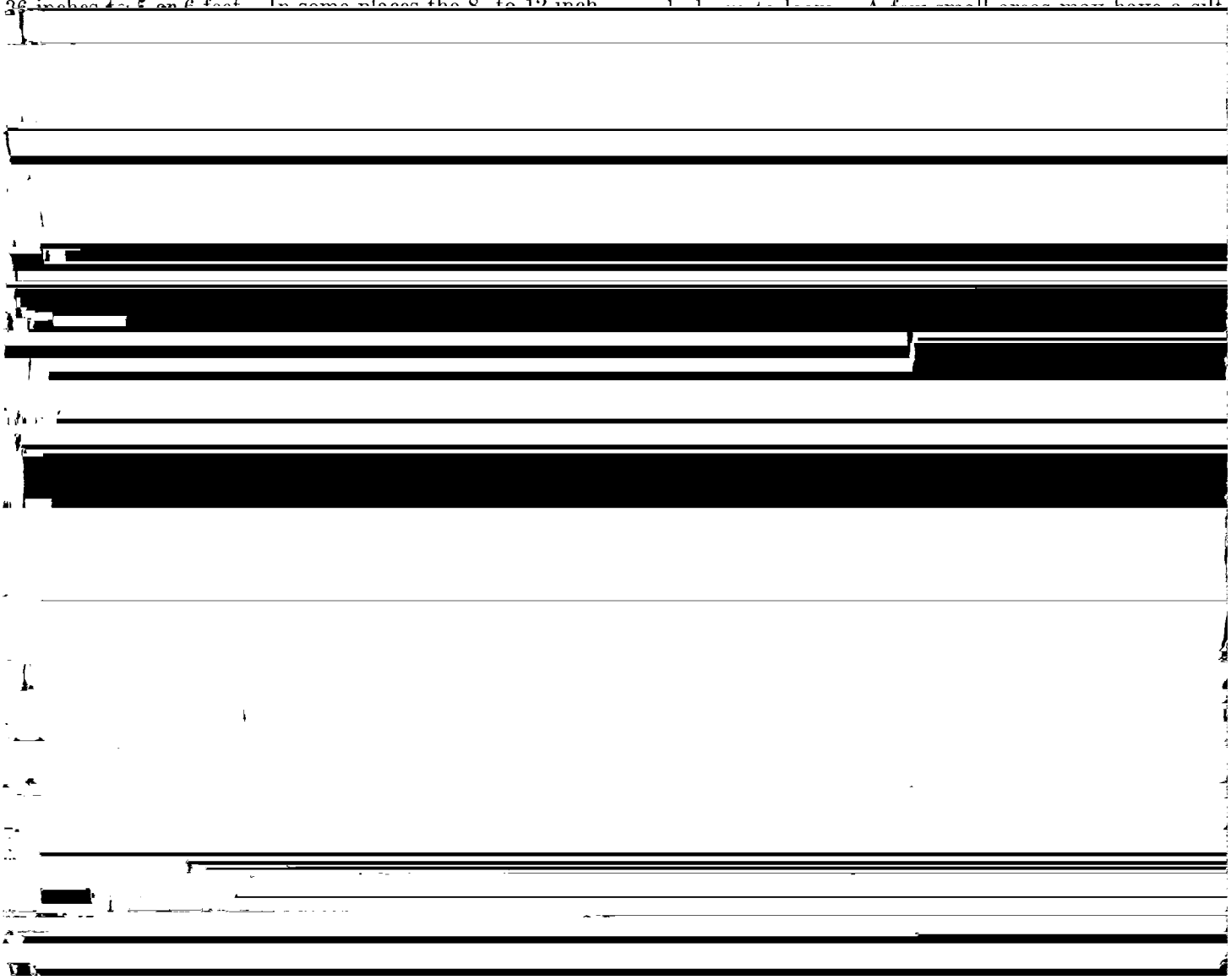
Ooltewah fine sandy loam (0 to 2 percent slopes) (Oo).—Like Ooltewah silt loam, this soil consists of moderately well drained to somewhat poorly drained young local alluvium and colluvium. The material is more mixed in origin. In general it consists of a mixture of alluvium derived from limestone, sandstone, and, in some places, shale.

This soil occupies gentle depressions along drainageways. It is widely distributed throughout those parts of the Hermitage-Talbott-Colbert and the Holston-Tupelo-Robertsville soil associations that are not far removed from the steep, stony mountain slopes. The separate tracts are not large. Most of them are parts of smooth landscapes in which many of the soils are suitable for crops.

Profile description:

0 to 8 inches, grayish-brown to reddish-brown fine sandy loam.
8 to 16 inches, brown fine sandy loam or friable fine sandy clay loam faintly mottled with yellow and gray.
16 inches +, mottled yellow, gray, and brown material that ranges widely in texture; in some places material is fine sandy loam and in others it may be a silty clay loam or silty clay; very firm residual silty clay or clay occurs in some places at depths of 3 to 4 feet; limestone bedrock is at depths of 6 feet or more.

The texture of the surface layer ranges from loose fine



Profile description:

0 to 6 inches, light yellowish-brown friable loam.
6 to 15 inches, yellowish-brown firm but rather friable silty clay loam, in most places mottled with pale yellow, gray, and yellowish red.
15 to 45 inches, strongly mottled yellowish-gray, yellowish-brown, and red compact stiff very firm clay; sandstone, shale, or limestone bedrock is at depths of 2½ to 4 feet.

Drainage varies considerably. In some places the profile is free of mottling to a depth of 14 or 15 inches. In others this 14- to 15-inch layer is strongly mottled or gray to within a few inches of the surface.

Pearman loam is low in plant nutrients and organic matter. It is medium to strongly acid. The surface layer has fairly good tilth, but the subsoil is slowly permeable to moisture and roots; consequently runoff develops rapidly. Internal drainage is slow, and the capacity for holding moisture available to plants is moderate. This is a cold soil, and field work is delayed considerably following wet periods.

Use suitability.—Much of this soil has been cleared, but probably not more than 25 percent of it is now used for crops. Most of the rest is pastured. Corn, soybeans, lespedeza, and, to some extent, cotton are the chief crops. Yields are not high.

This soil can be used for tilled crops. Its low fertility, compact subsoil, slow drainage, and susceptibility to erosion make it rather poorly suited to crops. Such general farm crops as corn, sorghum, soybeans, and legumes and [redacted]

The texture of the surface layer ranges from loose fine sandy loam to heavy loam. The subsoil in many places is sandier than the soil in the surface layer. The fine sandy loam texture in some places extends throughout the profile.

Prader fine sandy loam has low to moderate fertility. The supply of organic matter in the surface layer is small. Predominantly the soil is slightly acid, but in some places it is medium acid, and in a few places it is neutral to slightly alkaline. The plow layer has good tilth. The soil to depths of 12 to 14 inches is permeable to both roots and moisture. In places, where the subsoil is sandier, the soil is permeable throughout. The development of roots is enhanced by the predominantly wet subsoil. The water table, during much of the year, is within a few feet of the surface. During the wettest seasons it is at the surface or above. Both internal drainage and runoff are very slow.

Use suitability.—About 40 percent of this soil is still under native cutover deciduous forest. The rest has been cleared or partly cleared and is usually pastured. Corn, soybeans, lespedeza, cowpeas, and sorghum are the principal crops grown on the small acreage that is cultivated. Yields are variable but generally are not high.

The poor drainage and susceptibility to floods make this soil poorly suited to tilled crops. Cleared areas support a variable amount of pasture vegetation. Unless [redacted]

is very slowly permeable to both. Internal drainage is very slow, and runoff is slow to very slow. The capacity for holding moisture available to plants is not high. This soil is rather droughty during the drier parts of the growing season. The heavy texture and the slowness with which excess water leaves the soil cause it to be cold. Field work is delayed during wet periods.

Use suitability.—About 25 percent of the acreage has been cleared, and most of this is pastured. On the small area that is cultivated, corn is the principal crop, but some soybeans, sorghum, and lespedeza for hay are also grown. Little fertilizer is used, and, as a result, crop yields generally are low.

This soil is suitable for intensive use if adequate fertilizer and drainage are provided. Many areas cannot be drained easily and therefore are suitable only for pasture. If adequate drainage is provided, and the soil fertilized and properly seeded, a desirable type of pasture vegetation can be maintained. Otherwise, the pasture will not be of high quality.

Adequately drained and fertilized areas are productive of some crops. Among the crops best suited are corn, soybeans, sorghums, and the moisture-tolerant legumes and grasses. The soil is not well suited to truck crops and is poorly suited to such crops as cotton and alfalfa. Methods of use and management are discussed under group 14 in the section Use and Management of Soils.

Rockland, limestone, steep (Over 25 percent slopes) (Rs).—This land type occurs on steep slopes. Limestone bedrock outcrops and loose fragments of limestone are abundant on the surface. A small and variable amount of soil that is predominantly very firm silty clay or clay is intermixed with these limestone outcrops and loose fragments. This soil ranges from grayish brown to yellowish brown or reddish yellow. It is similar to the subsoil of the Colbert and Talbott soils. In general, there is not enough soil material to be cultivated or to grow pasture grass.

This steep rockland is very extensive; it occupies positions on a great part of the mountain slopes. It covers some of the lower and smaller mountains almost entirely. The higher mountains, such as those along the eastern border of the county, have a strip of Stony steep land, Muskingum soil material, above the areas of Rockland limestone, steep.

Use suitability.—Practically all of this land type is [redacted]

slopes or along their lower edge. Some of it occupies positions on the ridgetops of the lower mountains, which are capped by limestone rather than by the sandstone characteristic of the higher mountaintops. This land type is widely distributed throughout the more mountainous sections of the county. Most of it, however, is on the lower small mountains south and southeast of Huntsville.

Use suitability.—Practically all of this land type is under cutover native deciduous forest, which consists mainly of oak and hickory. On the lower lying areas, such as those at the foot of the mountains, the forest cover consists of a mixed stand of deciduous hardwoods and cedar. In places cedar is predominant. Although pines are common in some areas, they are not numerous on much of the acreage. Some beech and yellow-poplar grow in the more favorable sites.

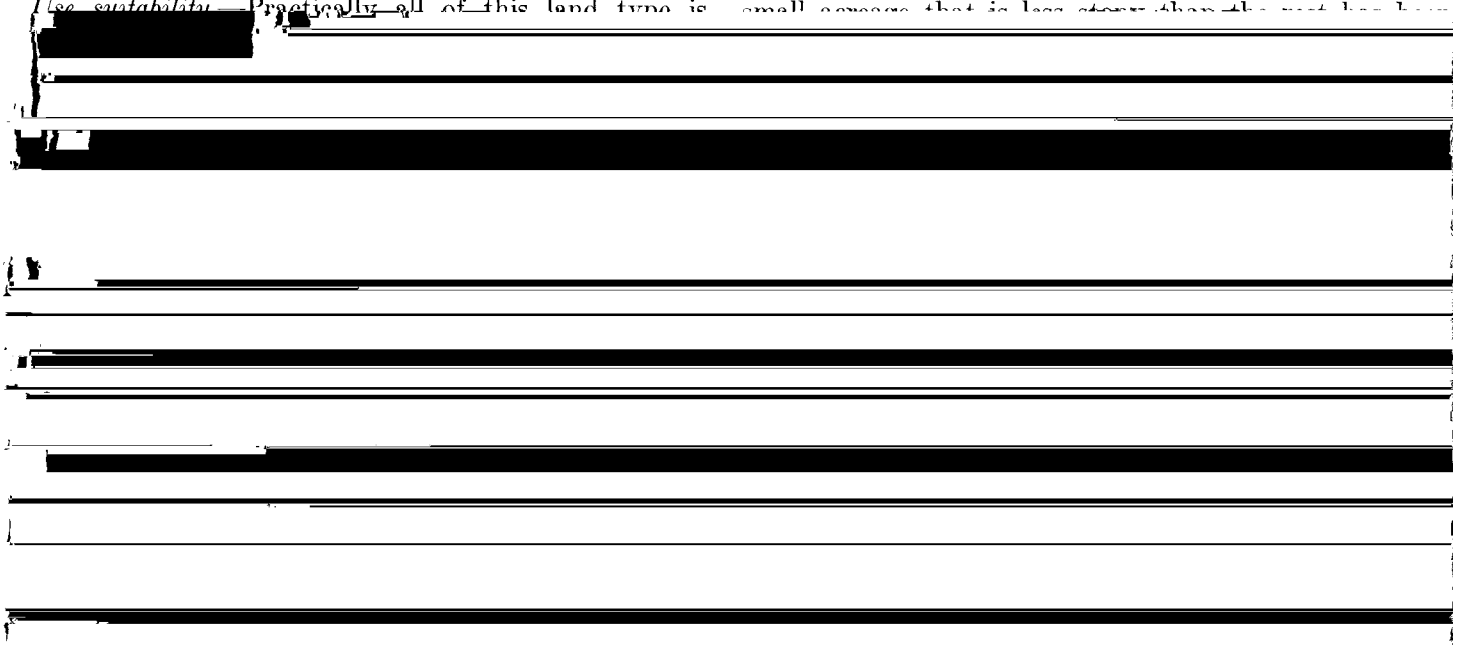
Some areas on the lower slopes have been cleared of underbrush and are used for woodland pasture. A few small areas of Stony land, Talbott and Colbert soil material, which are included in this mapping unit, are suitable for pasture. These areas are generally so small and so isolated, however, that this use is not practical.

Because of their sparse soil and isolation, areas of this land type can best be used for forest. Use and management are discussed under group 15a in the section Use and Management of Soils.

Rockland, limestone, rolling (2 to 12 percent slopes) (Rp).—This land type is characterized by numerous limestone outcrops and loose fragments intermixed with a variable amount of clayey Talbott soil material or material that resembles Colbert soils. In most places more than 50 percent of the surface area is covered by rock outcrops and loose rock, but in a few areas there is more soil material. Usually, the surface layer has more soil material than the hilly and steep phases of Rockland, limestone.

This land type occupies positions on low limestone ridges or knolls below and separate from the mountains, or is on gently sloping benches on the mountain slopes. Some occurs on the ridgetops of the lower mountains.

Use suitability.—Most of this land is under cutover forest that is usually a mixture of deciduous hardwoods and cedar. In places the forest is nearly all cedar. A small acreage that is less steep than the rest has been



Profile description:

0 to 7 inches, grayish-brown friable fine sandy loam.
7 to 15 inches, reddish-brown to yellowish-red friable but somewhat firm fine sandy clay loam that becomes finer

this one of the more desirable soils of the county for crops and pasture. It responds well to proper management and is suited to numerous crops, including cotton, corn, small grains, alfalfa and a number of legumes and grasses for

and other crops for home use are grown on these tracts. Practically all the field work is done by hand because the many stones prevent the use of farm equipment. Much of this land type, especially the less stony areas, will produce good stands of the more desirable legumes and grasses for pasture if it is cleared and fertilized. Use and management are discussed under group 15 in the section Use and Management of Soils.

Stony smooth land, Talbott and Colbert soil materials (2 to 6 percent slopes) (Su).—This land type differs from the associated Stony rolling land, Talbott and Colbert soil materials, mainly in having a smoother surface. It occupies positions at the base of steep stony mountain slopes in the eastern and southeastern parts of the county.

Use suitability.—Most of this land is in wooded pasture. A small part, which has been cleared completely, may be used for subsistence crops. As a rule, areas that have been cleared develop a volunteer stand of legumes and grasses. Such stands can be improved by fertilizer and supplementary seeding. Use and management are

pally by a less plastic, less compact subsoil. It is somewhat better drained than Robertsville silt loam, but it is somewhat more poorly drained than the associated Humphreys and Etowah soils. Most of it lies at slightly lower elevations than the Humphreys and Etowah soils.

Profile description:

0 to 6 inches, light yellowish-brown friable silt loam.
6 to 20 inches, predominantly brownish-yellow mellow friable silt loam weakly mottled with yellow and gray, especially in the lower part of the layer.
20 to 38 inches, strongly mottled gray, yellow, and brown firm silty clay loam; limestone bedrock at 4 to 20 feet.

The texture of the surface layer in some places is silty clay loam. In some areas, the subsoil is firm to very firm silty clay, which resembles the subsoil of Tupelo silt loam. Small dark iron concretions occur throughout the profile in a great many areas, especially in the subsoil.

Taft silt loam is moderately fertile, but its content of organic matter is low. It is medium to strongly acid. The plow layer has moderately good tilth and is permeable

Profile description:

0 to 5 inches, brown to light reddish-brown firm silty clay loam.
5 to 15 inches, reddish-brown to yellowish-red very firm silty clay loam that grades to silty clay; weak to moderate fine blocky structure.
15 to 28 inches, yellowish-red very firm silty clay faintly mottled with brown and reddish yellow; moderate fine blocky structure.
28 to 42 inches, mottled yellowish-brown, pale-yellow, pale-brown, and reddish-brown very firm silty clay; clayey limestone bedrock is at depths of 2 to 6 feet.

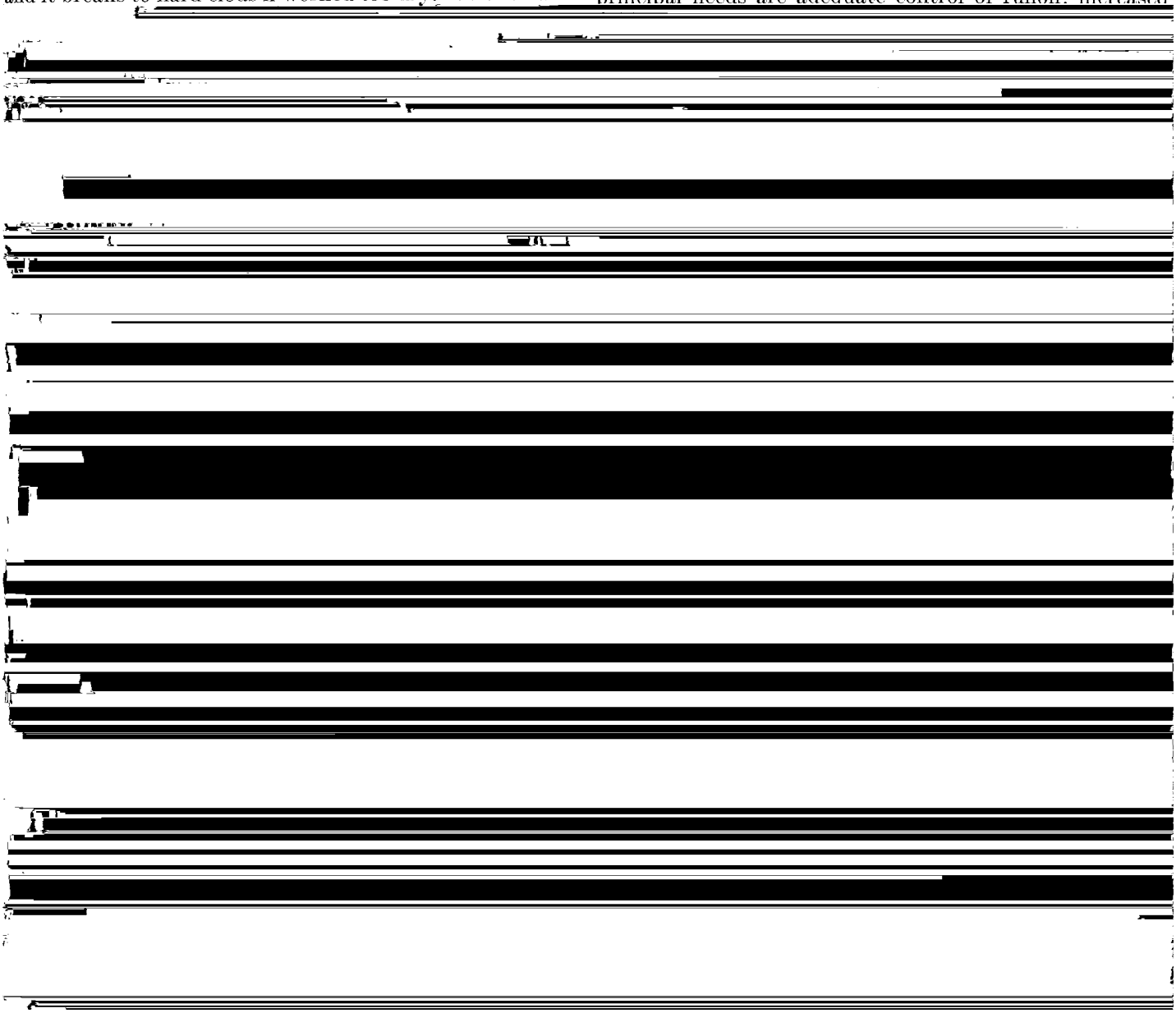
In the less eroded areas the surface layer is 6 to 7 inches thick and consists of brown silt loam. In contrast, some severely eroded areas have lost all of the original surface soil and have a plow layer that consists of yellowish-red very firm silty clay. There are a few rock outcrops. Chert fragments occur in some areas but are not numerous enough to interfere materially with cultivation.

The supply of plant nutrients and organic matter is moderate, and the soil is medium to strongly acid. In the less eroded areas the surface soil has fairly good tilth, but in most places the tilth is somewhat poor because the soil is clayey. The soil should not be cultivated if too wet, and it breaks to hard clods if worked too dry. The surface very firm silty clay. Clayey limestone bedrock is at depths of 1½ to 5 feet. A few gullies occur in the more eroded areas. Most of these are shallow, but some may be large enough to require considerable filling. Limestone outcrops are common, especially on the more sloping acreage.

This is a moderately fertile soil, but its content of organic matter is low. It is medium to strongly acid. The plow layer has poor tilth. The soil, on the whole, is slowly permeable to moisture and roots. Internal drainage is slow and runoff is rapid. The capacity for holding moisture available to plants is low, and the soil is therefore droughty.

Use suitability.—All of this soil has been cropped at some time. Now, much of it has reverted to unimproved pasture or has been reforested by natural seeding. The tilled acreage is used principally for cotton and corn, but yields are usually low.

This soil has greatly limited suitability for crops because of its unfavorable tilth and low moisture supply. It requires long rotations that consist chiefly of close-growing small grains, and grasses and legumes for pasture and hay. Its principal needs are adequate control of runoff, increased



Although the soil is fairly well suited to tilled crops, the high chert content greatly interferes with field work, especially with tillage and mowing. The slow permeability causes runoff to develop quickly on the more sloping areas, and moderately long rotations are required to control it. Among the more general farm crops for which the soil is suited are cotton, small grains, and alfalfa and other legumes and grasses for hay and pasture. This soil is not well suited to truck crops because it has poor tilth and a firm subsoil. Productivity of crops that need moisture during the driest parts of the growing season is restricted. Methods of management are discussed under group 7 in the section Use and Management of Soils.

Talbott cherty silty clay loam, eroded rolling phase (6 to 12 percent slopes) (Tc).—This soil is widely distributed throughout the Hermitage-Talbott-Colbert soil association. Practically all areas in this association occur on very gentle valley slopes directly below the stony steep mountain slopes. Some areas are in the Holston-Tupelo-Robertsville soil association in the southeastern part of the county.

Practically all of this phase is so eroded that the plow layer now consists of a mixture of surface soil and subsoil material. The 4- to 5-inch surface layer is predominantly reddish-brown cherty silty clay loam. The subsoil is yellowish-red very firm cherty silty clay. At 14 to 16 inches it grades to mottled red, yellow, and gray very firm cherty silty clay. Limestone bedrock occurs at depths of 1½ to 5 feet.

[redacted]

This soil is poorly suited to most truck crops. Its productivity for pasture is especially restricted during the drier parts of the growing season because reserve moisture is lacking. Use and management are discussed under group 10 in the section Use and Management of Soils.

Talbott cherty silty clay, severely eroded rolling phase (6 to 12 percent slopes) (Td).—Much of this soil is on valley slopes directly below steeper mountain areas. The separate tracts are small and are intricately associated with less eroded Talbott soils. Most of the soil occurs in the Hermitage-Talbott-Colbert soil association.

The plow layer consists almost entirely of yellowish-red to reddish-brown very firm cherty silty clay or clay. To a depth of about 10 inches, the subsoil is similar to the plow layer. The underlying material is mottled red, yellow, and gray very firm cherty clay. Limestone bedrock is at depths of 1 to 4 feet.

Some limestone outcrops are on the more strongly sloping areas. Some gullies occur. They are usually small and shallow, but a few may be difficult to fill. The chert content varies. In some areas it is so abundant as to make tillage very difficult or impractical, but in others it interferes little with cultivation.

The soil is low in plant nutrients and organic matter. It is medium to strongly acid. It has good tilth in the plow layer but can be worked only within a very narrow moisture range. If too wet when cultivated, the soil forms a plastic mass; if too dry, it breaks into hard clods that are difficult to work to a good seedbed. The soil is slowly permeable to both roots and moisture. It has

[redacted]

of the sandy material and the clayey subsoil. Gravel or cobbles occur in some areas; most of these areas are represented on the soil map by symbol.

Talbott fine sandy loam, eroded undulating phase, is moderately fertile and has some organic matter in the surface layer. It is medium to strongly acid. The sandy layer has good tilth and is permeable to roots and moisture. The underlying clayey material, however, is slowly permeable and retards internal drainage. The capacity for holding moisture available to plants is moderate.

Use suitability.—All of this soil has been cleared. Much of it is cropped at the present time, and a small part is pastured. Corn, cotton, and hay are the chief crops. Some acreage is in small grains, grain sorghum, sweet sorghum, and a few truck crops. The soil is fairly desirable for crops. It is generally suited to practically all of the crops grown in the county, including alfalfa and truck crops. Areas that are shallow to clayey material, however, or in which the clayey material is part of the plow layer, are not well suited to truck crops.

The soil responds well to good management. It can be used in a moderately short rotation if care is taken to restrain runoff. Because of the slowly permeable subsoil, the moisture supply is somewhat less favorable than that of some of the more permeable well-drained soils. Use and management are discussed under group 7 in the section Use and Management of Soils.

Talbott fine sandy loam, eroded rolling phase (6 to 12 percent slopes) (TF).—Probably one-fourth of this soil has been severely eroded. Most of the soil occurs in the southeastern part of the county.

In severely eroded areas, the plow layer is predominantly very firm clay intermixed with some sand. The subsoil is yellowish-red very firm clay, mottled below a depth of about 15 inches. Limestone bedrock is at depths of 1½ to 5 feet. A few rock outcrops occur, and there may be some shallow gullies in the more exposed, severely eroded patches.

The supply of plant nutrients and organic matter is somewhat lower in this soil than in the eroded undulating phase of Talbott fine sandy loam. The soil is medium to strongly acid. Tilth varies according to the degree of erosion. Where much of the fine sandy loam remains, tilth is good. In areas where practically all of it has been lost, the tilth is very poor because of the clayey plow layer. The sandy soil material is permeable, but the underlying clayey subsoil is slowly permeable to both roots and moisture. Internal drainage is slow. The capacity for holding moisture available to plants varies according to the depth to the heavy subsoil. Generally the capacity is moderately low, but in the most severely eroded parts it is very low.

Use suitability.—Because of its slow permeability and rather low capacity for holding moisture available to plants, this soil is limited chiefly to sorghum, small grains, soybeans, and legumes and grasses for hay and pasture. Its small supply of moisture during the drier parts of the growing season greatly lowers its value as pasture. Methods of use and management are discussed under group 10 in the section Use and Management of Soils.

Talbott-Colbert cherty silty clay loams, eroded hilly phases (12 to 25 percent slopes) (TK).—This mapping unit is a complex of strongly sloping Talbott and Colbert soils. These two hilly phases are so intermixed and so gradational that it was not practical to separate them on the map. Most of the areas occur as narrow strips at the base of stony steep mountain slopes. They lie just above the smoother undulating and rolling Talbott and Colbert soils and associated soils of the limestone valleys.

Nearly all of the acreage is so eroded that the plow layer consists of a mixture of surface soil and subsoil materials. Consequently, the 4- to 5-inch plow layer is now yellowish-red to yellowish-brown silty clay loam intermixed in most places with sufficient chert to hinder tillage. The subsoil is yellowish-red, reddish-brown, or yellowish-brown very firm cherty silty clay. It grades to mottled very firm cherty silty clay at depths of 12 to 18 inches. Limestone bedrock is at depths of ½ to 3 feet.

Limestone outcrops, although fairly common, do not make tillage impractical. Some patches in the more exposed areas are so severely eroded that the plow layer now consists of yellowish-red or yellowish-brown very firm cherty silty clay. Shallow gullies are common in these areas; some of them may be too deep to obliterate by using the usual farm machinery.

The soils of this complex are not high in fertility, and their content of organic matter is low. They are medium to strongly acid. Generally, tilth is rather poor because of the clay texture of the soils. These soils are slowly permeable to roots and moisture, and internal drainage is slow. The rapid runoff is very erosive when the soils are cultivated.

Use suitability.—Practically all of this complex of soils has been cleared at some time. Only about 30 percent of it is now used for crops, mainly corn, cotton, soybeans, and cowpeas. Yields of all crops are rather low, and, except for cotton, little or no fertilizer is used. Some of the land has reverted to forest. Much of it is in unimproved pasture in which volunteer lespedeza and Dallisgrass usually predominate.

The strong slopes, low moisture supply, and slow permeability of the subsoils make the soils of this complex poorly suited to crops that require tillage. As pasture, the land will afford a considerable amount of grazing during the moister periods of the growing season, and much of the acreage can be improved for this purpose. Use and management are discussed under group 13 in the section Use and Management of Soils.

Tupelo silt loam (0 to 2 percent slopes) (TU).—This light-colored, somewhat poorly drained soil is distinguished from Taft silt loam by its very firm plastic clayey subsoil. It consists of fine-textured general alluvium derived mainly from clayey residuum that originated from clayey limestone.

This soil occurs on low stream terraces. Much of the acreage is in the southeastern part of the county in the Holston-Tupelo-Robertsville soil association. Other areas are in the south-central part of the county. Many individual areas are fairly large. They are part of smooth landscapes that consist of poorly drained soils, as well as of a considerable acreage of soils sufficiently well drained to be fairly well suited to crops.

Profile description:

0 to 5 inches, light-gray to pale-brown heavy silt loam that crushes easily to a soft mellow mass.

5 to 12 inches, faintly mottled pale yellowish-gray, yellowish-brown, and reddish-yellow silty clay loam that grades with depth to firm or very firm silty clay.

12 to 26 inches, strongly mottled yellowish-brown, yellowish-gray, and reddish-brown very firm silty clay or clay that breaks fairly easily to angular fragments; limestone bedrock usually at depths of 5 to 7 feet, although in many places it is much shallower; an occasional rock outcrop may occur.

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A variable amount of small, hard, dark concretions occur throughout the soil, especially in the subsoil. In many areas a considerable number are on the surface.

The content of plant nutrients and organic matter is rather low, and the soil is medium to strongly acid. The surface layer has fairly good tilth, but the subsoil is very slowly permeable to both roots and moisture. Internal drainage is slow, and surface runoff is moderately slow to slow. During the wetter parts of the year the water table is sometimes less than a foot from the surface. During the drier seasons, it is at a depth of several feet. The soil has a moderate capacity for holding moisture available to plants and is not droughty. In practically all of it drainage is inadequate for the more exacting crops. On the whole, the soil is cold. Field work is greatly delayed following wet periods.

this soil has more moisture during the drier parts of the growing season than many of the well-drained, higher lying soils.

Use suitability.—Much of this soil is used for crops. Corn, cotton, small grains, and soybeans and legumes and grasses for hay and pasture predominate. The yields are higher than on Tupelo silt loam, as drainage is somewhat more favorable.

This soil is suited to a fairly large number of crops including cotton, corn, sorghums, small grains, soybeans, and most of the commonly grown legumes and grasses. Although internal drainage is greatly impaired, drainage in general is better than in Tupelo silt loam. Therefore, more of the acreage is suitable for cotton. Except where the overwash layer is 8 to 10 inches thick, this soil is not well suited to most trees. Like [illegible]

lime, or seeding. If artificial drainage is adequate, yields of crops, including cotton, are fairly good.

The very slow runoff, slow internal drainage, and low fertility make this soil poorly suited to cultivated crops. Some areas that have better natural drainage produce fairly good pasture, but in general a rather poor type of vegetation prevails. Artificial drainage greatly improves the soil for both crops and pasture. Adequately drained areas respond well to fertilizer and, if well managed, will produce good yields of corn, soybeans, grain sorghum, and many of the more moisture-tolerant legumes and grasses for hay and pasture. The low position of the soil and excess moisture during the winter may make a good stand of small grains difficult to maintain. Generally the soil in the adequately drained areas is desirable for crops that need an abundant supply of moisture during the drier parts of the growing season. Use and management are discussed under group 14 in the section Use and Management of Soils.

[redacted]

[redacted]

This moderately well drained brown soil occupies low [redacted]

Use suitability.—Practically all of this soil has been cleared, and much of it is now cropped. A small acreage that is not available for agricultural use may be within the boundary of the Red Stone Arsenal. Corn, cotton, soybeans, and lespedeza are the chief crops, but some fall-sown small grains and other hay crops besides soybeans and lespedeza are grown. Some fertilizer is used. Most areas are planted fairly intensively to row crops. Except during the drier season, yields are moderately high.

This soil has good workability and fairly good tilth. It is not difficult to conserve. Runoff should be carefully restrained, because any material loss of the friable surface soil will bring the compact subsoil nearer the surface and thereby make moisture conditions less favorable. Under good management the soil is well suited to intensive use for a wide variety of crops, including cotton, small grains, grain sorghum, soybeans, and most of the more desirable legumes and grasses for hay and pasture. Methods of use and management are discussed under group 2 in the section Use and Management of Soils.

Experiment Station regarding the time and rate of planting should be followed.)
6. Use suitable measures to control weeds, insects, and diseases.

and their yields are much higher than the average for the county. In general, these farmers do these things:

1. Use good crop varieties that are adapted to the county.
2. Use a suitable rotation that will use the water on the land to the best advantage. This rotation, as a rule, will include legumes to add nitrogen; row crops to control

Management groups

The practices just outlined apply to all of the soils of the county, but the various soils differ in their suitability for agricultural use and in the management they need. The soils therefore have been separated into 17 different

TABLE 7.—*Suitable crops, rotations or cropping systems, supplementary water-control measures, and need for amendments by management groups for soils of Madison County, Ala.*—Continued

Management group and soil	Suitable crops	Rotations or cropping systems	Supplementary water-control measures	Need for amendments	Remarks
Group 3—Continued Hermitage silt loam: Eroded undulating phase. Undulating phase.					
Group 3a Baxter cherty silt loam: Eroded undulating phase. Undulating phase. Dewey cherty silty clay loam, eroded undulating phase. Etowah cherty silt loam, undulating phase. Hermitage cherty silt loam, eroded undulating phase.	Cotton, corn, soybeans, grain sorghum, crimson clover, and many of the legumes (including alfalfa) and grasses for hay and pasture, small grains, nursery stock.	Same as for group 3.	Contour tillage; cover crops to follow row crops.	Moderately high for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	A little lower in fertility and more difficult to till than soils of group 3.
Group 4 Allen fine sandy loam: Eroded undulating phase. Undulating phase. Allen stony fine sandy loam, eroded undulating phase. Hartsells fine sandy loam: Eroded undulating phase. Eroded undulating shallow phase. Undulating phase. Undulating shallow phase. Holston fine sandy loam: Eroded undulating phase. Level phase. Undulating phase. Jefferson fine sandy loam: Eroded undulating phase. Undulating phase. Linker fine sandy loam, eroded undulating phase.	Cotton, corn, soybeans, grain sorghum, crimson clover, many of the legumes (including alfalfa) and grasses for hay and pasture, small grains, nursery stock, several truck crops. Possibly a little less suited to some legumes and grasses for pasture than soils of group 3a.	Same as for group 3.	Contour tillage; cover crops to follow row crops.	High for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	Good tilth easily maintained. Heavy fertilization required.
Group 5 Captina and Capshaw loams, undulating phases. Captina and Capshaw silt loams: Level phases. Undulating phases. Dickson cherty silt loam: Eroded undulating phase. Undulating phase. Dickson silt loam: Eroded undulating phase. Level phase. Undulating phase.	Corn, cotton, sorghums, soybeans, small grains, many of the legumes and grasses for hay and pasture.	Same as for group 3.	None on the more nearly level parts. Contour tillage; cover crops to follow row crops on the more sloping parts.	High for all plant nutrients, lime, and organic matter.	Slow internal drainage limits range of suitability somewhat and delays tillage practices a little. Probably better suited to sericea lespedeza than to alfalfa.
Group 6 Colbert silt loam, level phase. Dowellton silt loam. Hollywood silty clay	Legumes and grasses for hay and pasture, sorghum, small	1. Continuous pasture. 2. Small grain, hay	Some of the acreage could be improved by drainage	High for all plant nutrients, lime, and organic matter	All have slow internal drainage and, in general, unfavorable tilth.

TABLE 7.—*Suitable crops, rotations or cropping systems, supplementary water-control measures, and need for amendments by management groups for soils of Madison County, Ala.*—Continued

Management group and soil	Suitable crops	Rotations or cropping systems	Supplementary water-control measures	Need for amendments	Remarks
Group 7—Continued Pearman loam. Talbott cherty silty clay loam, eroded undulating phase. Talbott fine sandy loam, eroded undulating phase. Talbott silty clay loam, eroded undulating phase.					
Group 8 Cookeville silt loam, eroded rolling phase. Cumberland loam, eroded rolling phase. Decatur and Cumberland silty clay loams, eroded rolling phases. Etowah silty clay loam, eroded rolling phase. Hermitage silt loam, eroded rolling phase.	Practically all crops common to the region, although notably less suited to some truck crops than smoother, more friable soils.	1. Cotton or corn-sericea lespedeza or other legumes and grasses for hay or pasture. 2. Cotton, small grain, legumes and grasses for hay or pasture.	Contour tillage; winter cover; possibly terraces and diversion ditches in places.	Moderately high for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	Under a high level of management, responsive and productive of a wide variety of crops.
Group 9 Baxter cherty silt loam: Eroded rolling phase. Rolling phase. Dewey cherty silty clay loam, eroded rolling phase. Dickson cherty silt loam: Eroded rolling phase. Rolling phase. Hermitage cherty silt loam: Eroded rolling phase. Rolling phase.	Corn, cotton; sorghums, soybeans; small grains; many legumes and grasses for hay and pasture excepting alfalfa.	Same as group 8	Contour tillage and winter cover.	High for all plant nutrients, lime, and organic matter.	Requires heavy fertilization for large yields. Chert interferes somewhat with cultivation.
Group 10 Colbert cherty silty clay loam, eroded rolling phase. Colbert silty clay loam, eroded rolling phase. Talbott cherty silty clay loam, eroded rolling phase. Talbott fine sandy loam, eroded rolling phase. Talbott silty clay loam, eroded rolling phase.	Small grains; legumes and grasses for hay and pasture; some row crops, as corn, cotton, soybeans, and sorghum.	1. Chiefly sod crops, including sericea lespedeza. Row crop once in 4 to 7 years.	Contour tillage and winter cover.	High for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	Somewhat droughty and cloddy. Better suited to small grains, hay, and pasture than to row and truck crops.
Group 11 Allen fine sandy loam, eroded rolling phase. Allen stony fine sandy loam, eroded rolling phase. Hartsells fine sandy loam: Eroded rolling phase. Eroded rolling shallow phase. Rolling phase. Rolling shallow phase. Jefferson fine sandy loam, eroded rolling phase. Jefferson stony fine sandy loam, eroded rolling phase.	Corn, cotton, sorghum, soybeans, small grains, legumes and grasses, many truck crops.	1. Sod crop, as sericea lespedeza, with a row crop 1 year out of 3 to 6. 2. Row crop, small grain, sod crop 3 or 4 years.	Contour tillage, winter cover, possibly terraces and diversion ditches in places.	Very high for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	Suited to a wide variety of crops; has better tilth and lower fertility than soils of group 10.
Group 12 Allen clay loam, severely eroded rolling phase. Baxter cherty silty clay loam: Severely eroded rolling phase. Severely eroded undulating phase. Decatur and Cumberland silty clays: Gullied phases. Severely eroded rolling phases. Severely eroded undulating phases.	Small grains, legumes and grasses for hay and pasture.	1. Sod crops, as sericea lespedeza, with cotton every 4 to 7 years. 2. Permanent pasture.	Contour tillage, winter cover, diversion ditches.	High for all plant nutrients, lime, and organic matter. Boron probably required for alfalfa.	Limited supply of moisture, slow infiltration of water, and unfavorable tilth greatly limit the usefulness of these soils.

For each management group there is a table showing yields to be expected under two levels of management—the prevailing management and the improved management practiced by a few of the better farmers of the county.

In columns A of these tables are yields obtained under prevailing management, and columns B, yields to be obtained under improved management. The average estimated yields are based on records for at least a 5-year period. The yields in columns B can be obtained by following management methods that most farmers in the county will find practical. In fact, yields higher than those given in columns B can be obtained in favorable seasons, especially if heavier fertilization is practiced. To increase yields from those shown in columns A to those in columns B will require at least two rotation cycles under the improved level of management. Frequently, higher yields are obtained than those given for the improved level of management.

The yields given in the tables are subject to change. New crop varieties and new cultural practices may increase yields, and new plant diseases or insect pests may affect them adversely.

Management requirements for permanent pasture as well as for tilled crops are discussed for most of the groups. The management requirements for pasture may be similar for two or more groups, but each group has management requirements for tilled crops that distinguish it from all of the other groups. This happens because, on most soils, tilled crops require more exacting management than pasture.

Management group 1

The soils of management group 1 (listed in table 8) are nearly level to very gently sloping and are well drained to imperfectly drained. They are widely distributed and cover approximately 14 percent of the total area of the county. These soils occur on first bottoms or along small drainageways on slopes derived from local alluvium. The Abernathy and Ooltewah soils are on local alluvium and ordinarily are not subject to overflow. They may be flooded temporarily during heavy rains. The Egam, Ennis, Huntington, Hamblen, and Lindside soils are on bottom lands. All the soils on bottom lands are subject to floods except when they are protected by levees or other structures.

The Abernathy, Ennis, and Huntington soils are well drained; they are free of mottling to a depth of 25 inches or more. Although Egam silty clay loam is well drained in the plow layer and upper subsoil, drainage is somewhat slow in the lower part because of the compactness of the lower layer. The Hamblen, Lindside, and Ooltewah soils, all imperfectly drained, are mottled to within 10 to 14 inches of the surface.

All of the soils of this management group have moderately high to high fertility. The soil material is uniformly thick and is permeable to roots and moisture. The capacity of these soils for holding moisture available to plants is high. Their plow layers have a desirable texture, and tilth is good.

Use and management.—Much of the acreage of the soils of this group has been cleared and is used for crops, but a considerable part is pastured. Little is under forest. Corn is the most extensive crop, and hay is second in importance. Yields are moderately high. Usually, only light applications of fertilizer are added, and in places none is used. A few of the areas that have poor natural drainage have been drained artificially. Floods during the growing season cause some crop losses to occur on the soils of the first bottoms.

The smooth surface, abundant moisture, good tilth, and high natural fertility make these soils suitable for intensive use. As a rule they can be used continuously for row crops, and good yields are possible if high fertility is maintained.

The variety of crops that can be grown is somewhat limited, however, especially on the imperfectly drained soils. Such soils are not well suited to the high-value crops because of danger from floods. Small grains, particularly those on the soils that are not so well drained,

TABLE 8.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on soils of management group 1, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management. Absence of yield data indicates crop specified is not commonly grown or the soil is not suited to its production]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Abernathy cherty silt loam	35	65	300	500	12	20	33	50	2.9	3.8	1.2	1.8	125	185	150	225
Abernathy fine sandy loam	30	60	300	500	12	22	40	50	2.8	3.6	1.1	1.7	120	190	145	215
Abernathy silt loam	40	70	300	500	12	20	33	50	3.1	4.0	1.3	1.8	130	190	160	240
Egam silty clay loam	30	50	250	450	16	24	35	60			1.0	1.5			110	180
Ennis silt loam	35	65	300	500	18	24	35	60	3.0	3.8	1.2	1.8	90	140	130	210
Hamblen fine sandy loam	30	60	200	480			30	50			1.2	1.8			125	190
Huntington fine sandy loam	30	60	300	500	12	22	40	50	2.8	3.6	1.1	1.7	120	190	145	215
Huntington silt loam	40	70	300	500	10	20	40	50	3.1	4.0	1.3	1.8	130	190	160	240
Lindside silty clay loam [2]	40	70		400		18		48			1.4	1.8			170	240
Ooltewah fine sandy loam [2]	30	60		400	10	20	34	48			1.1	1.7			145	215
Ooltewah silt loam [2]	40	70		400		18		48			1.4	1.8			170	240

[1] The term "cow-acre-days" is used to express the days per year that 1 acre will graze 1 cow without injury to the pasture.
[2] Yields in columns B obtained under management that includes adequate drainage.

have a tendency to lodge. Small grains are also more subject to such diseases as rust than they are when grown on higher soils. These soils are particularly suitable for corn, grain sorghum, and soybeans and many of the other legumes and grasses for hay and pasture. The more poorly drained soils are not suitable for potatoes and other root crops.

The soils will produce fairly high yields without fertilizer. They respond well to fertilizer because they have abundant moisture and favorable permeability. In some areas use of lime for the more exacting legumes will be justified. In other places, lime may not be needed. Generally, if row crops are adequately fertilized, they can be spaced more closely than on soils that have less moisture.

Except on the more clayey areas, good tilth is moderately easy to maintain on the soils of this group. Excessive moisture, however, delays field work in the spring and after rains, especially on the more poorly drained soils. Artificial drainage and the straightening of channels may improve this condition somewhat. In areas where floodwaters have a strong current, the soil of the plow layer should not be allowed to lie loose late in winter and early in spring. The flood hazard is greatest at that time, and extensive damage may result from scouring. Crop yields will be improved by control or eradication of the weeds that grow abundantly on these soils because of the fertility and good moisture supply.

The abundant moisture and high fertility of the soils make them favorable for pasture. If stands of legumes and pasture grasses are good, the pasture will have a high carrying capacity throughout much of the grazing season. A good pasture mixture consists of fescue and white-clovers, including Ladino clover, but orchardgrass, Dallisgrass, bluegrass, and the annual lespedezas are also suitable for pasture seeding. Lime, a substantial application of phosphorus and potash, and enough nitrogen to get the seeding well established are important in obtaining a vigorous stand. Proper care of pastures, especially on these fertile bottom-land soils, requires that weeds and excess growth of the edible plants be kept down. This can best be done by mowing periodically during the growing season. If grazing is heavy, it may be practical to scatter droppings.

associated bottom-land soils, but they are nevertheless subject to floods. The total area is small.

This soil is very permeable, and as a result internal drainage is excessive. Moisture, however, is generally available to the deep-rooted crops because the water table is usually within 4 to 6 feet of the surface. Natural fertility is very low, and the content of organic matter is low. Plant nutrients are leached out easily because of the porous texture of this soil.

Use and management.—Most of this soil has been cleared, and most of it is pastured. Some acreage is planted to corn and to such crops as potatoes, melons, and soybeans. Yields are variable, but on the whole they are not high under average management. Some crops are fertilized, but pasture usually is not.

The sandy texture of the soil greatly limits its range of suitability for crops. It is too droughty for shallow-rooted crops such as small grains and for some of the grasses for pasture and hay. It is suited, however, to early spring vegetables and to the deeper rooted crops, including corn, melons, early potatoes, alfalfa, and sericea lespedeza. Bermudagrass ordinarily develops a good cover for pasture but has limited grazing value.

The low fertility and porous texture make heavy fertilization necessary for high yields of the crops suited to the soil. All plant nutrients are lacking; legumes will very likely need lime. Generally fertilizer should be added in small amounts at frequent intervals rather than in one or two heavy applications. This soil is well suited to intensive use where fertility is maintained, as it is not subject to damage from runoff water. In places it may be damaged by scouring if the main current of the stream leaves its banks during floods.

This soil is very easily worked and can be tilled throughout a wide moisture range. Its low fertility and sandy texture make weed control easy.

Management group 2

The soils of management group 2 (listed in table 10) are moderately well drained to well drained. Their surface is undulating to smooth. They occur on low stream terraces and local alluvium. The separate areas are not large. The soils are widely distributed through the

TABLE 10.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 2, Madison County, Ala.*

[Yields in columns A are those obtained under prevailing management; those in columns B are obtained under improved management.

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Etowah loam:																
Eroded undulating phase	28	58	330	530	17	24	29	50	2. 6	3. 3	0. 7	1. 8	80	130	85	185
Level phase	30	60	350	550	18	25	32	55	2. 8	3. 5	. 8	1. 9	85	135	100	200
Undulating phase	30	60	350	550	17	24	30	53	2. 7	3. 4	. 7	1. 8	80	130	90	190
Etowah silt loam:																
Level phase	30	65	350	550	18	26	32	57	2. 8	3. 6	. 8	2. 0	85	135	105	200
Undulating phase	30	65	350	550	18	25	32	55	2. 8	3. 5	. 8	1. 9	85	135	100	200
Etowah silty clay loam, eroded undulating phase	28	60	350	550	17	25	30	53	2. 7	3. 4	. 7	1. 9	80	130	90	190
Greendale cherty silt loam	27	60	270	490	12	23	30	58	2. 7	3. 6	. 9	1. 7	85	135	100	200

TABLE 11.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 3, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Cookeville silt loam:																
Eroded undulating phase	25	50	300	520	16	23	30	50	2. 1	3. 2	0. 7	1. 4	80	120	80	160
Undulating phase	28	55	350	550	18	25	32	55	2. 1	3. 2	. 7	1. 5	80	120	85	165
Cumberland loam:																
Eroded undulating phase	25	50	320	520	16	23	29	50	2. 7	3. 3	. 7	1. 4	80	120	80	160
Undulating phase	28	55	350	550	18	25	30	55	2. 8	3. 4	. 8	1. 6	80	120	90	175
Decatur and Cumberland silt loams:																
Level phases	35	62	380	580	20	27	35	57	3. 0	3. 6	. 9	1. 7	90	140	100	200
Undulating phases	32	55	380	580	20	27	35	57	3. 0	3. 5	. 8	1. 7	85	130	95	190
Decatur and Cumberland silty clay loams, eroded undulating phases	28	50	350	550	18	25	30	55	2. 8	3. 4	. 8	1. 7	80	120	90	175
Hermitage silt loam:																
Eroded undulating phase	28	50	350	550	17	24	30	52	2. 2	3. 2	. 7	1. 5	75	115	90	175
Undulating phase	30	55	380	580	18	26	33	55	2. 3	3. 3	. 7	1. 5	80	120	95	185

[1] The term "cow-acre-days" is used to express the number of days per year that 1 acre will graze 1 cow without injury to the pasture.

truck crops, and nursery crops. A large part of the acreage is planted to row crops continuously for several years. Practically all of the row crops are fertilized moderately. Some cover crops are grown for green manure, and lime has been applied to much of the acreage. Runoff water on the more sloping areas is not controlled adequately in many places. The level of management is generally not high, although some farmers practice very good management.

Except on the more eroded areas, the plow layer has good tilth and is not difficult to work to a good seedbed. However, more power is needed to till these soils than soils like Sequatchie fine sandy loam and Hartsells fine sandy loam. They should not be worked when too wet, although they can be tilled at a fairly wide moisture range. Increasing the supply of organic matter will help to maintain good tilth.

On the level phases and the smoothest parts of the undulating phases, erosion is not a great hazard. Runoff causes erosion on the more sloping areas, however; the soils should therefore be tilled on the contour, and row crops should be followed by a winter cover crop. On the more sloping areas, where fertility is somewhat low, a longer rotation may be desirable than is necessary for the group as a whole.

This group, in general, consists of strong soils; that is, they have at least a moderate reserve of plant nutrients and they retain added plant nutrients well. They are suitable for a number of crops, including cotton, corn, and many truck crops. They are not so suitable for many of the truck crops, however, as the more permeable friable soils such as Sequatchie fine sandy loam.

These soils are especially well suited to the more desirable legumes and grasses for hay and pasture. They do not have quite so abundant a moisture supply for pasture as such soils as the Huntington and Abernathy silt loams and Lindside silty clay loam. They are among the most desirable soils for cotton. They can be cropped intensively, but for most of the acreage 3- or 4-year rotations

All of these soils, although naturally of moderately high fertility, respond well to fertilizers. Phosphorus is the chief fertilizer needed, and lime is the principal supplement required. However, if high yields are to be maintained, nitrogen and potash in moderate amounts will also be necessary. Boron is needed for good stands of alfalfa. These soils lose their organic matter where tilled crops are removed. Legume winter cover crops, turned under as green manure in the spring, and barnyard manure are the most suitable sources of organic matter.

These soils are well suited to pasture, but they need lime, adequate fertilizer, and proper seeding. Fescue, orchardgrass, Dallisgrass, sericea lespedeza, and white-clovers are among the more desirable pasture plants. If fertility is brought to a high level, and a desirable vegetation is established, these soils will afford good pasture except during the driest periods of the grazing season. Weeds are likely to be a detriment, especially where fertility is high. The pastures should be mowed periodically to keep the weeds from competing for moisture and plant nutrients.

Management group 3a

Enough chert in their plow layers to interfere materially with tillage, and a little lower fertility, distinguish the soils of management group 3a (listed in table 12) from the ones in groups 3 and 4. The soils of this group are undulating, well drained, and moderately to considerably deep to bedrock. They cover about 3½ percent of the county and are widely distributed throughout the southern and central parts.

These soils are moderately fertile and have at least a small amount of organic matter in the plow layer. They are medium to strongly acid. The subsoils are firm, but they are permeable to roots and moisture. The soils have a moderate capacity for holding moisture available to plants. Except in the cherty or more eroded areas, they have good tilth.

Use and management. Much of the acreage is cleared

TABLE 12.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 3a, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Baxter cherty silt loam:																
Eroded undulating phase	22	42	330	500	16	21	27	50	1. 9	3. 0	0. 6	1. 4	70	110	70	150
Undulating phase	24	42	340	520	16	21	27	50	1. 9	3. 0	. 6	1. 4	75	120	70	150
Dewey cherty silty clay loam, eroded undulating phase	26	48	330	500	16	23	28	50	2. 1	3. 2	. 7	1. 5	75	115	80	160
Etowah cherty silt loam, undulating phase	28	57	330	520	16	24	28	52	2. 7	3. 4	. 7	1. 8	80	130	90	190
Hermitage cherty silt loam, eroded undulating phase	26	48	330	510	16	22	28	50	2. 1	3. 0	. 7	1. 4	75	115	85	170

[1] The term "cow-acre-days" is used to express the number of days per year that 1 acre will graze 1 cow without injury to the pasture.

of the acreage is planted to row crops for several years in succession. On a small part, moderately long rotations are used. Some small areas may lie idle for a few years. Some fertilizer is used for row crops; much of the soil has been limed. In general, the content of organic matter is not maintained at a high level, and runoff water is not controlled adequately on much of the acreage.

Although the soils of group 3a have a lower general fertility level than the soils of group 3, they are well suited to a number of crops. These include cotton, alfalfa, some truck crops, and most of the legumes and grasses for hay and pasture. Most of these soils warm early in the spring and are therefore somewhat more favorable for early crops than some of the fine-textured chert-free soils. Where the fertility is maintained at a high level, most of the acreage can be used in a moderately short rotation (about 3 years).

Generally the fertilizer requirements are a little higher than for the soils of group 3. If the more exacting legumes are to be grown, lime is necessary. To maintain high productivity, substantial amounts of organic matter must be applied at intervals. If the supply of barnyard manure is inadequate, a legume cover crop is of considerable value if turned under. Regular applications of boron are needed to maintain good stands of alfalfa.

Maintenance of good tilth for these soils, especially for the more eroded areas, requires some attention. Applications of organic matter will improve tilth, and the soils should not be worked when too wet. Tillage, expecially on the more sloping areas, should be on the contour to check erosion caused by runoff water. Terracing may be necessary in some places. Some of the less fertile, more sloping areas may require moderately long, 4- to 5-year, rotations to control runoff water.

These soils support good pasture. For high productivity, however, heavy fertilization and proper seeding are required. Generally good grazing is more difficult to maintain on these soils than on those of group 3. Lime and mixed fertilizers are needed to establish pastures. Probably additional applications of fertilizer at intervals will be necessary in order to maintain a highly productive pasture. In most places periodic mowing will help remove excess plant growth and suppress weeds. Much of the acreage is somewhat more droughty for pasture than the more silty areas of the soils in group 3.

Management group 4

Soils of management group 4 (listed in table 13) are well drained to excessively drained. Most of them are undulating. Their plow layers consist of fine sandy loam or loam; their subsoils, although moderately firm, are more permeable and friable than those of the soils in group 3.

These soils cover nearly 3 percent of the county. The Hartsells and Linker soils occur on smooth mountain ridges, which are capped by sandstone. A small acreage of Linker soil is associated with the Hartsells soils on the mountaintops. The Allen and Jefferson soils occupy the smoother parts of old colluvial slopes at the foot of the mountains. The Holston soils occur on nearly level, moderately high stream terraces. They are located mainly in the vicinity of New Hope.

The soils are medium to strongly acid; their content of organic matter and plant nutrients is low. Depth to bedrock varies but ranges from about 14 inches in the shallow Hartsells soils to 7 to 8 feet in the Allen and Jefferson soils, or to 3 to 15 feet in the Holston soils. Except for the shallow phases of the Hartsells soils, the capacity for holding moisture is moderate. In addition, the soils are permeable enough for roots to penetrate deeply. As the Hartsells and Linker soils occupy positions on mountaintops, they are in a slightly cooler climate than the Jefferson, Allen, and Holston soils.

Use and management.—Some of the Hartsells soils are still under forest, but much of the acreage of Jefferson, Allen, and Holston soils has been cleared. Much of the cleared acreage is terraced, and the terraces are well maintained. Cotton is the predominant crop grown on the soils of this group, and corn is second in acreage. Row crops are grown successively for several years on some of the soils, and they receive moderate to heavy applications of fertilizer. A large part of the tilled acreage has been limed.

The moderately sandy plow layers make tillage easy. Except on the small patches where the more clayey subsoil makes up a large part of the plow layer, good tilth is easy to maintain. Excess moisture percolates through the soil rather rapidly. In general, these soils can be tilled throughout a fairly wide moisture range. Tillage is feasible for longer periods than on most of the other soils.

TABLE 13.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 4, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management. Absence of yield data indicates the crop specified is not commonly grown]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days*[1]	*Cow-acre-days*[1]
Allen fine sandy loam:																
Eroded undulating phase	25	50	300	520	16	23	28	50	2. 1	3. 2	0. 6	1. 4	80	120	80	160
Undulating phase	27	55	350	550	18	25	30	55	2. 1	3. 2	. 7	1. 5	80	120	80	160
Allen stony fine sandy loam, eroded undulating phase	23	45	290	500	15	22	26	48	2. 0	3. 1	. 6	1. 3	80	120	75	155
Hartsells fine sandy loam:																
Eroded undulating phase	26	58	325	625	15	22	25	50		3. 0	. 8	1. 5	150	200	55	150
Eroded undulating shallow phase	21	48	250	460	10	18	20	40		2. 6	. 5	1. 2	95	145	45	130
Undulating phase	26	60	350	625	15	22	25	50		3. 0	. 8	1. 5	125	200	55	150
Undulating shallow phase	24	50	280	500	11	20	20	42		2. 7	. 6	1. 3	100	150	45	135
Holston fine sandy loam:																
Eroded undulating phase	24	45	320	520	16	21	27	50	1. 8	2. 9	. 6	1. 4	80	120	75	155
Level phase	27	50	320	520	18	25	30	55	1. 9	3. 0	. 7	1. 5	85	125	80	160
Undulating phase	24	50	320	520	16	21	27	50	1. 8	2. 9	. 6	1. 4	80	120	75	155
Jefferson fine sandy loam:																
Eroded undulating phase	24	45	320	520	14	21	26	50	1. 8	2. 9	. 5	1. 3	75	120	75	155
Undulating phase	24	45	320	520	16	21	27	50	1. 8	2. 9	. 6	1. 4	80	120	75	155
Linker fine sandy loam, eroded undulating phase	27	49	350	625	15	22	26	52		3. 0	. 8	1. 5	150	200	60	150

[1] The term "cow-acre-days" is used to express the number of days per year that 1 acre will graze 1 cow without injury to the pasture.

The good tilth, smooth surface, moderately favorable moisture, and capacity to respond well to good management make these soils suitable for a number of crops. These include cotton, sorghum, and soybeans and many other legumes and grasses for pasture and hay, and numerous truck crops such as strawberries, beans, and potatoes. Organic matter and large amounts of nitrogen, phosphate, and potash are needed for high yields. If the more desirable legumes are to be grown, it is necessary to apply 1 to 2 tons of crushed limestone, and it may be necessary to reline in 8 or 10 years. As a rule, regular

undulating. The depth to bedrock ranges from moderate to deep. The plow layers are predominantly easily worked silt loam.

These soils cover about 7 percent of the county, and some of the separate areas are of medium to large size. The Captina and Capshaw soils occupy moderately high stream terraces, chiefly in the southeastern part of the county. The Dickson soils occur principally in the northwestern quarter of the county.

The content of plant nutrients and organic matter is moderately low. The soils are medium to strongly acid

TABLE 14.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 5, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management. Absence of yield data indicates the crop specified is not commonly grown or the soil is not suited to its production]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Captina and Capshaw loams, undulating phases	28	55	250	500	12	20	30	53	-----	3.0	0.8	1.7	85	125	95	190
Captina and Capshaw silt loams:																
Level phases	28	55	200	400	12	20	25	50	-----	-----	.8	1.7	80	120	100	195
Undulating phases	28	55	240	480	12	20	30	53	-----	3.0	.8	1.7	80	120	95	190
Dickson silt loam:																
Eroded undulating phase	22	42	320	520	14	20	27	50	-----	2.8	.6	1.4	70	115	70	150
Level phase	20	40	300	500	14	20	27	50	-----	2.8	.7	1.5	70	115	80	170
Undulating phase	22	42	340	520	14	20	27	50	-----	2.8	.6	1.4	75	120	70	150
Dickson cherty silt loam:																
Eroded undulating phase	20	40	310	500	13	19	26	48	-----	2.8	.6	1.4	70	115	65	140
Undulating phase	20	40	310	500	13	19	26	48	-----	2.8	.6	1.4	75	120	65	140

[1] The term "cow-acre-days" is used to express the [illegible]

The soils of this management group cover about 4 percent of the county. In general they are only moderately fertile, and none of them have a high content of organic matter. Except for the Hollywood soils, which are slightly acid to slightly alkaline, these soils are medium to strongly acid.

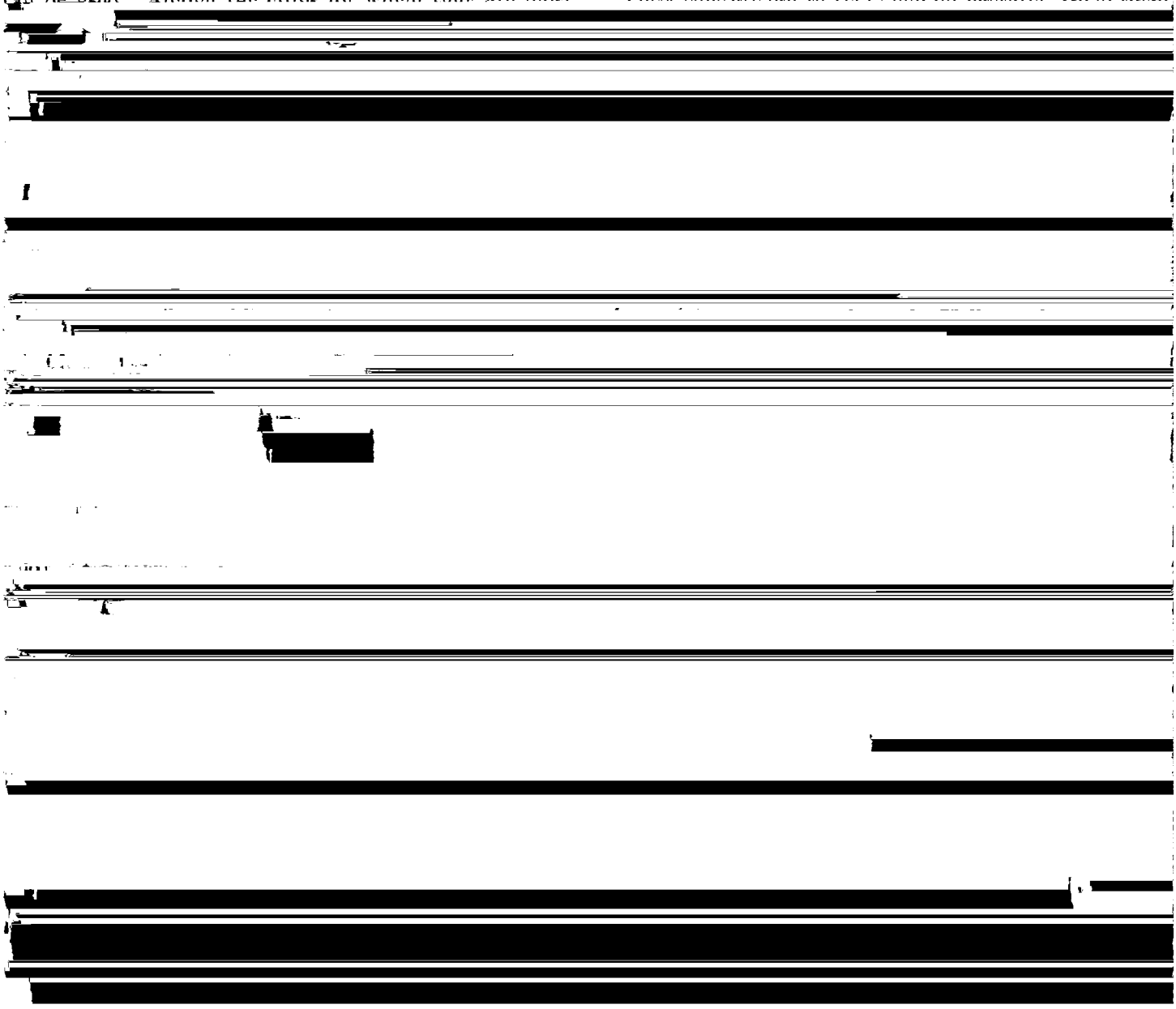
Use and management.—Approximately three-fourths of the area of the soils of this management group has been cleared. The uncleared areas are chiefly under cutover native deciduous forest. About 60 percent of the cleared acreage is cropped, and the rest is mainly in unimproved pasture or is idle. The predominant crops are corn, cotton, and lespedeza for hay, and yields generally are fair to moderate. Most of the areas are not fertilized heavily. Drainage has been improved in a few places by means of open ditches.

The soils of this group are fairly well suited to crops and pasture. However, their poor internal drainage and predominantly clayey subsoils restrict the range of crops to which they are suited and the management practices that can be used. Among the crops for which they are most

Tilth of the plow layer is unfavorable in most of these soils. The plow layers in much of the Monongahela fine sandy loam and in the overwash phase of Tupelo silt loam, however, are sufficiently loamy to be fairly easily tilled. Most of the other soils need careful tillage because they puddle easily when plowed too wet and become cloddy. They require a great deal of power for tillage when too dry, and break into hard chunks that are difficult to work to a good seedbed. Because of slow internal drainage, these soils remain too wet to till for a considerable time following rains and are too cold and wet for early spring planting.

Improvement of the surface drainage by artificial means would improve tillage for many areas, especially on the Lawrence, Monongahela, Taft, and Tupelo soils. Better surface drainage for these soils, and additional organic matter for all except possibly the Hollywood soils, should increase productivity and the range of crops that can be grown. Since these soils have slowly permeable clayey subsoils, it is unlikely that tile drainage would improve them greatly.

These soils are fair to very good for pasture. All of them



clayey subsoils. Their surface layers and upper subsoils are well drained to moderately well drained; their lower subsoils and parent materials are moderately well drained to somewhat poorly drained. Depth to bedrock ranges from less than 2 feet to about 6. Bedrock outcrops in places, and large boulders occur, particularly in the Colbert soils. The surface texture ranges from silty clay loam to fine sandy loam.

The Colbert and Talbott soils were derived from clayey limestone and clayey cherty limestone. The Pearman soil was derived from interbedded shale, sandstone, and limestone. The materials derived from shale are predominant. The surface soils and upper subsoils in some areas, however, contain considerable material from sandstone and are rather friable.

The soils of this group occupy positions on undulating uplands. Relief ranges from less than 2 to 6 percent. These soils cover less than 2 percent of the county. Much of the acreage occurs in the southern and southeastern parts and on valley slopes below and adjacent to steep mountain slopes.

The natural fertility is moderate, and the content of organic matter is low. The soils are medium to strongly acid. The uneroded or very slightly eroded areas are moderately easy to work, but the surface soils generally are shallow over tight clayey subsoils and are very erodible. As a result erosion has greatly impaired workability and tilth over considerable areas of these soils. The tilth in most places is fairly good but is not so favorable as that commonly found in the soils of groups 2, 3, and 4. Moisture absorption is rather slow, particularly in the eroded soils. Therefore the capacity for holding moisture available to plants is restricted and most areas are droughty during dry periods. Also, the slowly permeable subsoils cause runoff to develop quickly during rains.

Use and management.—Much of the acreage of the soils of this group has been cleared and is now cropped or pastured. Some of the land is idle part of the time. Cotton, corn, lespedeza, grain sorghum, soybeans, and field peas are among the most commonly grown crops. Moderate amounts of mixed fertilizer are commonly applied to the row crops, and much of the acreage has been limed. In general, organic matter and supplies of plant nutrients are far below what is needed for high crop yields.

These are fair to good crop soils and fair to very good pasture soils. They are suited to a number of general farm crops, including [illegible] alfalfa, and [illegible] hard clods when worked dry. A great deal of power is needed to till these soils.

There is enough slope on much of the acreage of these soils to justify contour farming. Few areas are suited to terracing, as the very plastic clay subsoil would be exposed. Furthermore, bedrock is so shallow in some areas that it would interfere with the construction of terraces and with subsequent cultivation.

Practically all of these soils are productive of the more desirable legumes and grasses for pasture if adequately fertilized, limed, and seeded. Most areas used for pasture have a vegetative cover consisting of lespedeza and a variable amount of native grasses intermixed. The capacity of the soils of this group to hold moisture available to plants is much lower than for some of the more permeable friable soils, and grazing periods are somewhat more restricted. Periodic mowing of well-established vegetation will help to maintain the quality and grazing capacity of the pastures.

Management group 8

Soils of management group 8 (listed in table 17) are characterized by a reddish color, good drainage, and a rolling surface. They have moderately firm subsoils and are deep to bedrock. They cover about 2½ percent of the county and are widely distributed throughout the southern and central parts.

All of these soils have moderately high fertility and a moderate content of organic matter. Predominantly they are medium to strongly acid. Tilth of the plow layer ranges from fair on the more eroded areas to good on those less eroded. On the whole, except for the more severely eroded patches, these soils have a moderately high capacity for holding moisture available to plants. The severely eroded patches have a restricted moisture supply and are rather droughty during the extended dry periods.

Use and management.—Much of the acreage of the soils of this group is now cropped. Cotton is predominant, but a large acreage is in corn and hay, and some is in small grains, grain sorghum, and field peas. Row crops are grown for several years in succession on some areas, but rotations are used on part of the acreage.

Much of the land has been limed at some time during the past 15 years. Row crops, chiefly cotton, receive moderately heavy applications of mixed fertilizers. Fertility

TABLE 17.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 8, Madison County, Ala.*

[Yields in columns A are obtained under prevailing management; those in columns B are obtained under improved management]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Cookeville silt loam, eroded rolling phase	23	48	300	490	14	20	24	48	2.0	3.1	0.5	1.3	65	115	70	150
Cumberland loam, eroded rolling phase	23	48	310	500	15	23	27	50	2.4	3.2	.6	1.4	65	115	75	155
Decatur and Cumberland silty clay loams, eroded rolling phases	23	48	310	510	15	23	27	50	2.4	3.2	.7	1.5	65	110	80	165
Etowah silty clay loam, eroded rolling phase	22	50	300	490	14	21	24	48	2.2	3.1	.6	1.4	65	110	75	155
Hermitage silt loam, eroded rolling phase	23	48	310	510	14	22	27	48	2.3	3.0	.7	1.4	65	110	80	165

[1] The term "cow-acre-days" is used to express the number of days per year that 1 acre will graze 1 cow without injury to the pasture.

Winter cover crops that follow row crops are of great value in restraining runoff water during the winter.

Although these are among the stronger soils of the county, they respond well to proper fertilization and additions of lime and organic matter. Boron must be applied at regular intervals in order to maintain good stands of alfalfa. Contour farming is needed because of the moder-

combined with orchardgrass and Dallisgrass, are suitable for seeding.

Management group 9

The soils of management group 9 (listed in table 18) are well-drained to moderately well drained. Their relief is rolling. They have developed over cherty limestone

TABLE 19.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 10, Madison County, Ala.*

[Yields in columns A are obtained under the prevailing management; those in columns B are obtained under improved management. Absence of yield data indicates the crop specified is not commonly grown or the soil is not suited to its production]

Soil	Corn		Cotton (lint)		Wheat		Oats		Alfalfa hay		Lespedeza hay		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Colbert cherty silty clay loam, eroded rolling phase	9	23	130	280	6	13	11	30	------	------	0. 3	0. 8	45	100
Colbert silty clay loam, eroded rolling phase	10	25	140	300	7	14	12	32	------	2. 2	. 4	. 9	50	100
Talbott cherty silty clay loam, eroded rolling phase	14	33	175	330	11	16	24	38	1. 5	2. 1	. 4	1. 0	60	125
Talbott fine sandy loam, eroded rolling phase	16	35	210	350	14	19	25	42	1. 6	2. 2	. 5	1. 1	65	130
Talbott silty clay loam, eroded rolling phase	15	34	200	340	13	18	23	40	1. 5	2. 1	. 4	1. 0	60	125

[1] The term "cow-acre-days" is used to express the number of days per year that 1 acre will graze 1 cow without injury to the pasture.

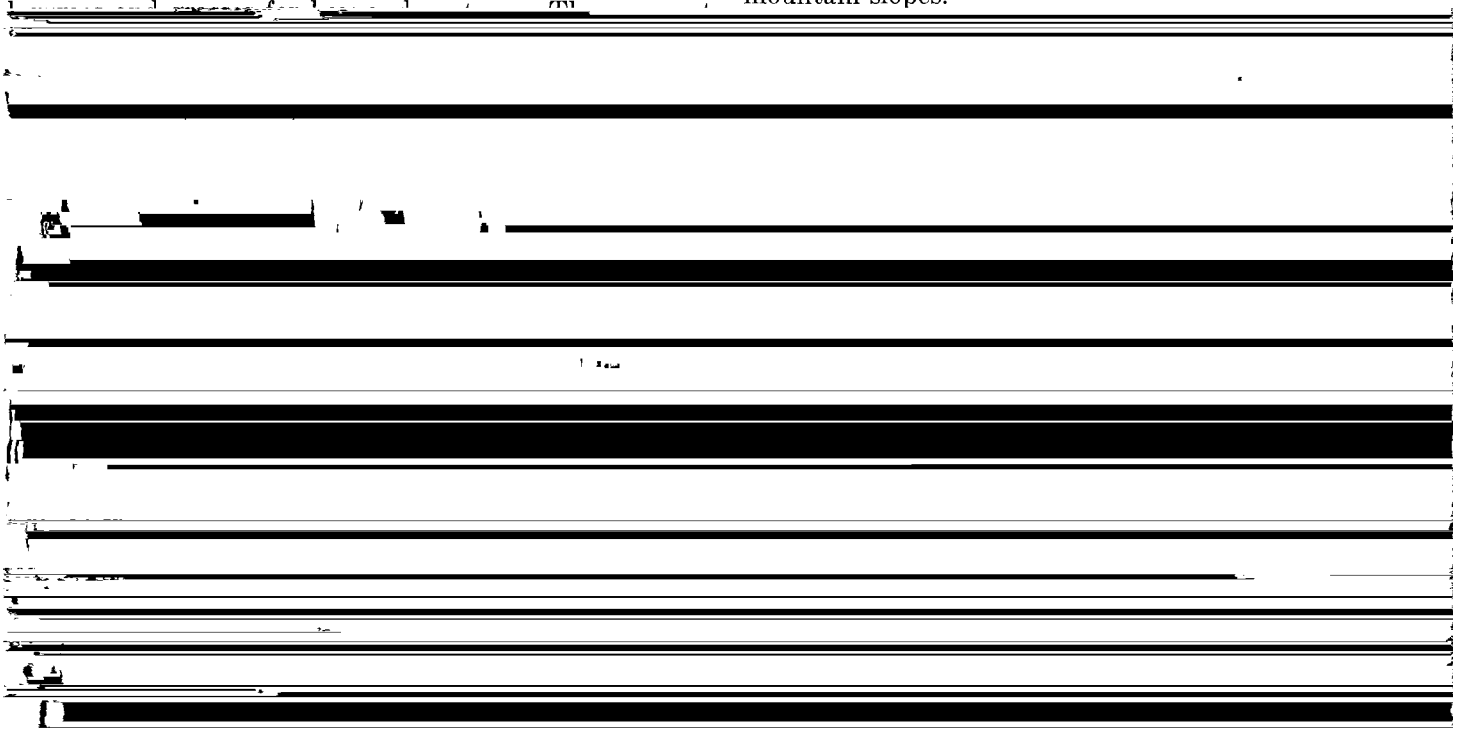
few years at a time. Cultivated areas are used for row crops about half the time. Cotton is the principal crop, but corn, small grains, and lespedeza for hay are also common. Some of the cleared acreage is in unimproved pasture.

Row crops, especially cotton, receive moderate applications of mixed fertilizer. Part of the acreage was limed at some time during the past 10 or 12 years. The organic-matter content of these soils is not well maintained. Yields are generally considerably below what can be expected under a high level of management.

These soils are suited to numerous general farm crops, including cotton, corn, small grains, and most of the

Management group 10

The soils of management group 10 (listed in table 19) are characterized by very firm to extremely firm silty clay subsoils, moderately shallow depth to bedrock, and rolling relief. They are differentiated from the soils of group 7 mainly by their stronger slopes and by the more numerous eroded patches where the very firm subsoil is exposed. Some of these soils have enough chert in the plow layer to interfere considerably with tillage. The soils of this group make up only about 1 percent of the area of the county. They occur mainly in the southern and southeastern parts on gentle valley slopes below and adjacent to the steep mountain slopes.



acreage can well be used for permanent pasture. Among the crops that are best suited to these soils are small grains and some of the more desirable legumes and grasses for hay. Corn, cotton, and grain sorghums are among the better suited row crops, but these cannot be grown at frequent intervals. The shallow depth to the firm clayey subsoils makes these soils poorly suited to truck and root crops. Rotations in which row crops are grown once in 4 to 7 years are necessary if the soils are to be kept reasonably productive.

The productivity of these soils is restricted principally by their limited capacity to supply water to plants. Substantial amounts of organic matter, at least moderate use of mixed fertilizer, and proper liming will improve productivity. Boron must be applied at regular intervals to maintain a vigorous stand of alfalfa. Sericea lespedeza appears to be more suitable for these soils, however, than alfalfa.

The heavy-textured plow layers of most of these soils require considerable power for tilling. The range of moisture under which they can be cultivated properly is very narrow. They puddle if tilled when too wet and develop into hard clods. They are very difficult to cultivate when too dry and will break into large hard fragments that are difficult to make into a good seedbed. Substantial applications of organic matter will help to improve the structure of the plow layer.

Tillage should be on the contour in order to control runoff. Terracing is not feasible because of the shallow depth to the very firm subsoil and to underlying bedrock. Moreover, many of the slopes are a little too steep for practical terracing. In some places diversion ditches can be used effectively to stop destructive accumulations of

Management group 11

Soils of management group 11 (listed in table 20) are friable and permeable; they consist chiefly of material derived from sandstone. Except for the shallow phases of the Hartsells soils, which have an average depth to bedrock of less than 18 inches, all have good drainage and moderate depth to bedrock. The relief is rolling. Sandstone fragments in some of them interfere considerably with cultivation.

These soils cover less than 2 percent of the county. The Hartsells soils occur on the broader, smooth mountaintops, and the Allen and Jefferson soils on the valley slopes below and adjacent to the steep mountain slopes.

The plow layers are generally very friable. They have good tilth and are easy to work except where stone fragments interfere or some difficulty is experienced in manipulating heavy machinery on the moderately strong slopes. All of the soils are low in organic matter and plant nutrients and are medium to strongly acid. Their friable permeable texture is favorable for extended root growth. Except for the shallow phases of the Hartsells soils, the soils of this group have a moderate capacity for holding moisture available to plants.

Use and management.—A large part of the acreage of Allen and Jefferson soils in this management group has been cleared and is now cropped or pastured or is idle. Much of the Hartsells soils is also cleared, but an appreciable acreage is still under cutover native deciduous hardwood forest.

Cotton, corn, and lespedeza for hay are the chief crops. Small grains for winter cover are sown in the fall on part of the acreage. Some of the soils are planted to cotton

the pasture is not of high quality, particularly on the Hartsells soils. Except for the acreage on Keel Mountain, most of the Hartsells soils in Madison County occur on relatively small sandstone plateaus, which are not readily accessible and are not sufficiently large to justify development into livestock farms.

The soils of this management group are fairly well suited to crops that require cultivation and to pasture. Suitable crops include cotton, corn, sericea lespedeza, alfalfa, and many of the truck crops. The productivity of these soils is somewhat restricted, however, by their limited capacity for holding moisture available to plants. Because of their fairly strong slope and active runoff on cultivated areas, these soils require moderately long rotations.

The soils respond well to proper fertilization. For good yields, most crops will need moderately heavy applications of complete fertilizer and organic matter. The more desirable legumes and grasses for hay and pasture will require lime. Alfalfa will need regular applications of boron in order to maintain a vigorous stand.

Good tilth is not difficult to maintain except on the more eroded areas. Even on these areas, tilth is not so unfavorable as that of some of the eroded soils developed [redacted]

tained with proper fertilization, liming, and seeding. Sericea lespedeza is one of the most desirable pasture plants. Weedy growth and excess herbage should be removed by mowing in order to maintain vegetation of good quality.

Management group 12

The soils of management group 12 (listed in table 21) are alike in that they have lost all of their original surface soil as a result of erosion. Their plow layers now consist of subsoil material, which usually consists of very firm or compact clay that is low in organic matter.

These soils cover about 4 percent of the county. The separate tracts are not large and are rather widely distributed over the valley areas. They are usually associated with smoother less eroded soils of the uplands and stream terraces. The soils of this group have poor tilth, and generally their capacity for holding moisture available to plants is low. They are predominantly reddish in color and are medium to strongly acid. All except the Talbott cherty silty clay have a moderate depth to bedrock.

Small gullies are common on these soils but usually are not large enough to make cultivation impossible. The gullied phases of Decatur and Cumberland silty clays, [redacted]

back into use as improved permanent pasture. Some of the acreage of this group has been limed, but most of it has not been fertilized heavily. Organic-matter content is much lower than it originally was in these soils.

These soils vary in productivity but they are not well suited to crop production. The productivity of all of them, however, can be increased enough to make them useful for cultivation. The gullied phases of the Decatur and Cumberland silty clays will need more mechanical preparation than the other soils. Most of this gullied land can be reclaimed by smoothing with heavy tillage implements, but bulldozers may be needed for filling the larger gullies. The severely eroded rolling phases of the Baxter and Talbott soils will require the greatest effort to raise their fertility and organic-matter content. The severely eroded rolling phase of Allen clay loam should be the least difficult to rejuvenate, as it is the most friable of all of these soils.

Small grains and certain grasses and legumes, including sericea lespedeza and alfalfa for hay and pasture, are among the crops best suited to these soils. Most of the row crops, such as cotton, corn, soybeans, and grain sorghums, can be grown. The unfavorable tilth and the low capacity of these soils for holding moisture available to plants make row crops less profitable, as a rule, than close-growing crops.

The soils of this group require long rotations, as it is important to keep them in condition to restrain runoff water. Lime, heavy applications of fertilizer, and substantial additions of organic matter are necessary to raise productivity to a fairly high level. Boron will be required if alfalfa is to be grown.

The unfavorable tilth of these soils makes the use of heavy machinery necessary for preparing a good seedbed. Deep-rooted legumes and additional organic matter will help to improve tilth. Tillage should be on the contour. Diversion ditches may help prevent accumulations of runoff water. Most areas are too small to make stripcropping feasible. This practice should be used, however, on those areas associated with other soils that will benefit from it. Most of these severely eroded soils are too steep for practical terracing.

Much of the acreage of these soils can best be used for permanent pasture. Establishment of new pastures requires considerable care. The clayey texture of the seedbed makes moisture difficult to maintain during germination and early growth. Furthermore, this texture and the strong slopes make erosion a great hazard while the stand is being established. Adequate fertilizer, lime, and proper seeding are necessary. Sericea lespedeza grown alone is among the best pasture plants for these soils. Substantial additions of organic matter will help to get the pasture established. In some places, it may be advisable to keep the areas under a forest cover or a cover of kudzu over a long period before an attempt is made to establish a more desirable type of permanent pasture.

Management group 13

The soils of management group 13 (listed in table 22) have strong slopes that range from 12 to 25 percent. Their content of stone is usually large, and chert fragments are sometimes abundant. These soils have friable to firm permeable subsoils.

The Baxter and Bodine soils were derived from cherty limestone, the Talbott-Colbert cherty silty clay loams from clayey cherty limestone, the Allen and Hermitage soils from old colluvium, and the Muskingum soils from sandstone interbedded in places with shale. The thickness of the soil material over bedrock varies widely. In the Muskingum soils, it ranges from less than 1 foot to about 3 feet. In the Baxter soils, bedrock may be at a depth of more than 20 feet.

The soils of this group cover less than 2 percent of the county. The hilly phase of Muskingum fine sandy loam

TABLE 22.—*Average acre yields of the principal crops, carrying capacity of pasture, and stand of forest to be expected over a period of years on the soils of management group 13, Madison County, Ala.*

[Yields in columns A are those obtained under prevailing management; those in columns B are obtained under improved management. Absence of yield data indicates crop specified is not commonly grown or the soil is not suited to its production]

Soil	Corn		Cotton (lint)		Oats		Sericea lespedeza hay		Common lespedeza hay		Pasture		Pine forest
	A	B	A	B	A	B	A	B	A	B	A	B	
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	
Allen stony fine sandy loam, eroded hilly phase	10	30	150	350	12	30	0.7	1.4	0.2	0.8	55	135	Good.
Baxter cherty silt loam:													
Eroded hilly phase	10	35	200	400	20	40	.7	1.4	.4	1.0	50	130	Good.
Hilly phase	12	36	220	400	15	35	.7	1.5	.3	.9	55	135	Good.
Baxter cherty silty clay loam, severely eroded hilly phase							.5	1.1	.3	.7	30	115	Good.
Bodine cherty silt loam:													
Eroded hilly phase	8	20	125	300	17	35	.4	1.0	.3	.8	20	100	Fair.
Hilly phase	8	20	125	300	10	30	.5	1.2	.4	.8	20	100	Fair.
Hermitage cherty silt loam, eroded hilly phase	14	32	170	360	12	30	.7	1.5	.4	1.0	60	145	Good.
Muskingum fine sandy loam, hilly phase	10	30	165	330			.8	1.6	.4	1.0	35	120	Good.
Talbott-Colbert cherty silty clay loams, eroded hilly phases							.4	1.0	.3	.7	50	115	Fair.

[1] The term "cow-acre-days" is used to express the number of days per year that 1 cow will graze [illegible]

occurs on the stronger slopes of the mountaintops in association with the Hartsells soils. The Allen, Hermitage, and Talbott-Colbert soils occupy positions along the lower parts of the steep mountain slopes. The Baxter and Bodine soils are predominantly in the northwestern part of the county.

These soils range from moderate to low in fertility and are medium to strongly acid. The content of organic matter is generally low; it is considerably lower in culti-

TABLE 23.—*Average acre yields of the principal crops and carrying capacity of pasture to be expected over a period of years on the soils of management group 14, Madison County, Ala.*

[Yields in columns A are those obtained under prevailing management; those in columns B are obtained under improved management including adequate drainage. Absence of yield data indicates the crop specified is not commonly grown]

the spring or following heavy rains. In addition to drainage, protection against overflow may be practical on a few areas.

To increase pasture productivity on most areas surface drainage must be improved so that more desirable grazing plants can dominate. Fertilizer and proper seeding are needed on all of these soils to establish a good pasture stand, and lime is required on the Guthrie, Lee, Lickdale, Robertsville, and Tyler soils. The soils are suitable for a fescue and whiteclover mixture and also for orchardgrass, Dallisgrass, and bluegrass. These soils under good

TABLE 24.—*Average carrying capacity of pasture to be expected over a period of years on the soils of management group 15, Madison County, Ala.*

[Yields in column A are obtained under prevailing management; those in column B are obtained under improved management]

Soil	Pasture	
	A	B

Use and management.—Most of the acreage is under cutover native deciduous forest. The productivity of forest is quite variable. Where there is a fair amount of soil material, especially on the north-facing slopes, a good stand of deciduous trees can be grown.

On the more stony sites, especially those facing to the south, forest growth is slow and of much less desirable quality. Most of this acreage can be managed by permitting revegetation, although planting may be practiced in a few places. In most areas, shortleaf and loblolly pines are best for planting. A few small areas have some pasture use, but usually the productivity of pasture vegetation will be low. In addition, enough vigorous grass growth will have to be maintained to protect the soil from erosion.

Additional Interpretive Soil Groupings

It will be easier to understand and use the soil map if the soils are grouped according to specific objectives. The grouping of soils according to management needs in the section Use and Management of Soils is an example of an interpretive grouping that will help those concerned with use and management problems. The soils can also be grouped in other ways; for example, according to lime requirements, fertility, drainage, slope, stoniness, or general suitability for crops.

Two classifications of the soils of Madison County should be of particular value. These are the capability groups of soils and the soil associations. These two groupings are discussed in the following pages.

Capability groups of soils

The capability grouping is an arrangement of soils to show suitability for crops, grazing, forestry, wildlife, or other uses, and the risks of erosion or other damage. It is widely used in helping farmers plan their practices for soil and water conservation.

Eight broad classes are provided in the capability arrangement although some of them do not occur in Madison County. Each soil is placed in one of these broad classes after joint study by several persons of the ways it responds when it is used.

Soils that are easy to farm and have no serious limitations for use are placed in capability class I. Such soils are not subject to more than slight erosion, drought, wetness, or other limitations and are at least fairly fertile. They are good for many uses. The farmer can use his class I soils for crops without special practices, other than those needed for good farming anywhere. He can choose one of several cropping patterns; or if he wishes he may use the soil for pasture, trees, or for other purposes.

Soils are placed in class II if they are a little less widely adaptable, and thus more limited than those in class I. For example, a gently sloping soil may have a slight erosion hazard that requires contour farming or other practices to ments than those in class II. The soils that are even more limited and have more narrow crop adaptations than those in class III, but are suitable for tillage part of the time, or with special precautions, are placed in class IV.

Soils not suitable for cultivation, or on which cultivation is not advisable, are in classes V, VI, VII, or VIII. Class V consists of soils not subject to erosion but unsuited to cultivation because of stoniness, standing water or frequency of overflow. Class VI contains the soils that are steep, droughty or shallow but will produce fairly good amounts of forage, orchard fruits, or forest products. As a rule class VI soils should not be cultivated, but some of them can safely be disturbed to prepare for planting trees or seeding long-producing forage crops.

Soils in class VII are more limited than those in class VI, require more care in handling, and usually give only fair to poor yields of forage or wood products. Class VIII consists of soils so severely limited that they produce little useful vegetation. They may provide attractive scenery or may be parts of valuable watersheds. Some may have value for wildlife.

Subclasses: Although the soils within a single capability class present use and management problems of about the same degree, the kinds of problems may differ greatly. These problems and limitations may be caused by erosion, designated by the symbol (e), excess water (w), shallowness, droughtiness, or low fertility (s).

Capability classes and subclasses in Madison County are given in the following list. The brief description of each subclass gives the general nature of most but not all of the soils included.

CLASS I.—Soils safe for use under intensive cultivation, without special practices to control runoff or erosion, and which may be expected to produce high yields with good soil and crop management. No subclasses are recognized in class I.

CLASS II.—Soils that can be used for tilled crops but under slight risks of erosion or other slight limitations.
- IIe: Undulating soils subject to erosion.
- IIw: Alluvial and colluvial soils affected by excess water.

CLASS III.—Soils that can be used for tilled crops, but under moderate risks of erosion or other moderate limitations.
- IIIe: Eroded undulating soils, rolling soils, and eroded rolling soils.
- IIIw: Soils moderately affected by excess water.

CLASS IV.—Soils that have severe limitations or high risks of soil damage when used for cultivation and when so used require special management.
- IVe: Hilly soils, eroded and severely eroded; undulating and rolling soils; and eroded hilly soils.
- IVw: Soils not well suited to crops because of excess water.

CLASS VI.—Soils too steep, or too sandy, for cultivation; suitable for pasture.
- VIe: Chiefly hilly, stony, or eroded soils and stony

The capability class and subclass for each soil are shown in the following list:

	Capability class and subclass
Abernathy cherty silt loam (AB)	I.
Abernathy fine sandy loam (AC)	I.
Abernathy silt loam (AD)	I.
Allen clay loam, severely eroded rolling phase (AL)	IVe.
Allen fine sandy loam:	
Undulating phase (AM)	IIe.
Eroded undulating phase (AN)	IIe.
Eroded rolling phase (AO)	IIIe.
Allen stony fine sandy loam:	
Eroded undulating phase (AP)	VIe.
Eroded rolling phase (AR)	VIe.
Eroded hilly phase (AS)	VIe.
Baxter cherty silt loam:	
Undulating phase (BA)	IIe.
Eroded undulating phase (BB)	IIe.
Rolling phase (BC)	IIIe
Eroded rolling phase (BD)	IIIe.
Hilly phase (BE)	IVe.
Eroded hilly phase (BF)	IVe.
Baxter cherty silty clay loam:	
Severely eroded undulating phase (BG)	IVe.
Severely eroded rolling phase (BH)	IVe.
Severely eroded hilly phase (BK)	VIIe.
Bodine cherty silt loam:	
Hilly phase (BN)	VIe.
Eroded hilly phase (BO)	VIe.
Steep phase (BP)	VIIe.
Bruno loamy fine sand (BR)	IIIe.
Captina and Capshaw loams, undulating phases (CA)	IIe.
Captina and Capshaw silt loams:	
Level phases (CB)	IIe.
Undulating phases (CC)	IIe.
Colbert cherty silt loam, undulating phase (CD)	IIIe.
Colbert cherty silty clay loam:	
Eroded undulating phase (CE)	IVe.
Eroded rolling phase (CF)	IVe.
Colbert fine sandy loam, eroded undulating phase (CG)	IIIe.
Colbert silt loam:	
Level phase (CH)	IVw.
Undulating phase (CK)	IIIe.
Colbert silty clay loam:	
Eroded undulating phase (CL)	IVe.
Eroded rolling phase (CM)	VIe.
Cookeville silt loam:	
Undulating phase (CO)	IIe.
Eroded undulating phase (CP)	IIe.
Eroded rolling phase (CR)	IIIe.
Cumberland loam:	
Undulating phase (CU)	IIe.
Eroded undulating phase (CV)	IIe.
Eroded rolling phase (CW)	IIIe.
Decatur and Cumberland silt loams:	
Level phases (DA)	I.
Undulating phases (DB)	IIe.
Decatur and Cumberland silty clays:	
Severely eroded undulating phases (DC)	IVe.
Severely eroded rolling phases (DD)	VIe.
Gullied phases (DE)	VIIe.
Decatur and Cumberland silty clay loams:	
Eroded undulating phases (DF)	IIIe.
Eroded rolling phases (DG)	IIIe.
Dewey cherty silty clay:	
Severely eroded undulating phase (DH)	IV.
Severely eroded rolling phase (DK)	VIe.
Dewey cherty silty clay loam:	
Eroded undulating phase (DL)	IIIe.
Eroded rolling phase (DM)	IIIe.
Dickson cherty silt loam:	
Undulating phase (DN)	IIe.
Eroded undulating phase (DO)	IIe.
Rolling phase (DP)	IIIe.
Eroded rolling phase (DR)	IIIe.
Dickson silt loam:	
Level phase (DS)	IIe.
Undulating phase (DT)	IIe.
Eroded undulating phase (DU)	IIe.
Dowellton silt loam (DV)	IVw.
Dunning silty clay (DW)	IIIw.
Egam silty clay loam (EG)	IIw.
Ennis silt loam (EN)	IIw.
Etowah cherty silt loam, undulating phase (ES)	IIe.
Etowah loam:	
Level phase (ET)	I.
Undulating phase (EU)	IIe.
Eroded undulating phase (EV)	IIe.
Etowah silt loam:	
Level phase (EW)	I.
Undulating phase (EX)	IIe.
Etowah silty clay loam:	
Eroded undulating phase (EY)	IIIe.
Eroded rolling phase (EZ)	IIIe.
Greendale cherty silt loam (GR)	IIe.
Greendale silt loam (GS)	IIe.
Guthrie silt loam (GU)	IVw.
Hamblen fine sandy loam (HA)	IIw.
Hartsells fine sandy loam:	
Undulating phase (HB)	IIe.
Eroded undulating phase (HC)	IIe.
Undulating shallow phase (HD)	IIIe.
Eroded undulating shallow phase (HE)	IVe.
Rolling phase (HF)	IIIe.
Eroded rolling phase (HG)	IIIe.
Rolling shallow phase (HH)	IVe.
Eroded rolling shallow phase (HI)	VIe.
Hermitage cherty silt loam:	
Eroded undulating phase (HJ)	IIe.
Rolling phase (HK)	IIIe.
Eroded rolling phase (HL)	IIIe.
Eroded hilly phase (HM)	IVe.
Hermitage cherty silty clay loam, severely eroded rolling phase (HN).	VIe.
Hermitage silt loam:	
Undulating phase (HO)	IIe.
Eroded undulating phase (HP)	IIe.
Eroded rolling phase (HQ)	IIIe.
Hollywood silty clay (HR)	IIIw.
Hollywood silty clay, eroded undulating phase (HS)	IIIw.
Holston fine sandy loam:	
Level phase (HT)	I.
Undulating phase (HU)	IIe.
Eroded undulating phase (HV)	IIe.
Humphreys cherty silt loam (HW)	IIe.
Humphreys silt loam (HX)	IIe.
Huntington fine sandy loam (HY)	IIw.
Huntington silt loam (HZ)	IIw.
Jefferson fine sandy loam:	
Undulating phase (JE)	IIe.
Eroded undulating phase (JF)	IIe.
Eroded rolling phase (JG)	IIIe.
Jefferson stony fine sandy loam, eroded rolling phase (JH)	VIe.
Lawrence silt loam (LA)	IIIw.
Lee silt loam (LE)	IIIw.
Lee-Lobelville cherty silt loams (LF)	IIIw.
Lee-Lobelville silt loams (LG)	IIIw.
Lickdale silt loam (LH)	IVw.
Lindside silty clay loam (LK)	IIw.
Linker fine sandy loam, eroded undulating phase (LL)	IIe.
Melvin silty clay loam (ME)	IIIw.
Monongahela fine sandy loam (MO)	IIe.
Muskingum fine sandy loam, hilly phase (MU)	VIe.
Muskingum stony fine sandy loam:	
Hilly phase (MV)	VIIe
Steep phase (MW)	VIIe.
Ooltewah fine sandy loam (OO)	IIw.
Ooltewah silt loam (OP)	IIw.
Pearman loam (PA)	IIIe.
Pits, clay (PC)	VIIe.
Pits, gravel (PG)	VIIe.
Prader fine sandy loam (PR)	IIIw.
Robertsville silt loam (RO)	IVw.
Rockland:	
Limestone, rolling (RP)	VIIe.
Limestone, hilly (RR)	VIIe.
Limestone, steep (RS)	VIIe.
Sequatchie fine sandy loam (SE)	I.
Sequatchie fine sandy loam, eroded phase (SF)	IIe.
Stony colluvium, Jefferson and Colbert soil materials (ST)	VIe.
Stony smooth land, Talbott and Colbert soil materials (SU)	VIe.
Stony rolling land, Talbott and Colbert soil materials (SV)	VIe.
Stony steep land, Muskingum soil material (SW)	VIIe.

	Capability class and subclass
Taft silt loam (TA)	IIIw.
Talbott cherty silty clay loam:	
Eroded undulating phase (TB)	IIIe.
Eroded rolling phase (TC)	IVe.
Talbott cherty silty clay, severely eroded rolling phase (TD)	VIe.
Eroded undulating phase (TE)	IIIe.
Eroded rolling phase (TF)	IVe.
Talbott silty clay loam:	
Eroded undulating phase (TG)	IVe.
Eroded rolling phase (TH)	IVe.
Talbott-Colbert cherty silty clay loams, eroded hilly phases (TK)	VIe.
Tupelo silt loam (TU)	IIIe.
Tupelo silt loam, overwash phase (TV)	IVw.
Tyler very fine sandy loam (TY)	IIIw.
Wolftever silt loam (WO)	IIe.
Wolftever silt loam, eroded phase (WP)	IIe.

types of farming but are especially desirable for cotton and livestock. They usually need lime to grow the more desirable legumes and grasses. The soils of the uplands also need organic matter, phosphorus, and potassium if fertility is to be brought up to and kept at a high level.

Soil associations

Each soil not only occupies a characteristic position, such as on uplands, bottom lands, or stream terraces, but

The Dickson-Lawrence soil association occupies a smooth upland in the northwestern part of the county. It covers about 11 percent of the county. The soils range from moderately well drained to poorly drained. The poorly drained soils occupy about a fifth of the association acreage. Much of the land has a weak to moderate pan at depths that range from 20 to 30 inches.

These soils are lower in fertility than those of the Decatur-Cumberland-Abernathy association. Since the soils were less attractive as agricultural land, this section of the county was developed later than the areas in which the Decatur-Cumberland-Abernathy soil association is located. Most of the Dickson-Lawrence association consists of soils that are fair to good for the agriculture of the

Some of these soils have been cleared and are planted to crops such as cotton, corn, and some hay, chiefly lespedeza. A considerable acreage, however, is still under cutover native deciduous forest.

If fertilized adequately, the soils are suited to a number of crops. These include cotton, hay, soybeans, sorghums, and numerous truck crops such as potatoes, tomatoes, beans, and strawberries. They are not so well suited to sod as the soils of the Decatur-Cumberland-Abernathy soil association. Although all of these soils need heavy fertilization, the chief drawback to their development is the difficulty of access.

Allen-Jefferson soil association

The Allen-Jefferson association consists mainly of reddish or yellowish friable well-drained soils, which are generally undulating to rolling. The soils of this association cover approximately 5 percent of the area in the county. They occur on gentle valley slopes, mainly in belts at the base of the steep stony mountain slopes. One area, however, directly south of Huntsville along the northern border of the Tennessee River, is an old high stream terrace rather than a colluvial slope. Although a great part of the association consists of friable well-drained soils, some patches of more plastic soils, such as Colbert and Talbott, occur on the slopes, and somewhat poorly drained soils occur along some of the streams.

Much of the acreage consists of soils that are fair to good for the prevailing agriculture. These soils are not so fertile as those in the Decatur-Cumberland-Abernathy soil association. They are more friable and permeable, however, and therefore have better tilth and are suitable for field work and crops earlier in the spring.

Most of the acreage has been cleared and is now cropped or pastured. Some is idle, reverting to forest, or in unimproved pasture. Cotton is the principal crop, but corn and hay are important.

Holston-Tupelo-Robertsville soil association

The Holston-Tupelo-Robertsville soil association consists predominantly of nearly level poorly drained to somewhat poorly drained soils and of gently undulating moderately well drained soils. In addition to their rather wide range in drainage, the soils vary considerably to erosion damage. Furthermore, a considerable part of these soils is inadequately drained. Because of these unfavorable characteristics, productivity is more difficult to maintain than for soils of the Decatur-Cumberland-Abernathy soil association. The tilth and permeability, however, make a large part of the acreage suitable for crops that need intensive tillage and early spring growth.

Much of the better drained acreage has been cleared and is used for general farming in which cotton is the chief cash crop. The poorly drained areas are still largely under forest, although some have been cleared for pasture and some for crops.

The better drained, more friable soils are well suited to alfalfa and to tilled crops such as cotton and market vegetables. The soils that have poor drainage and heavier texture are fairly suitable for a limited variety of crops. The soils that are the most poorly drained and have the most plastic clayey texture are poorly suited to tilled crops. Much of this acreage, however, could be made productive of pasture grasses and legumes if artificial drainage were installed. A large part of the acreage of this association is suitable for general livestock farming. A cash crop, however, such as cotton or truck crops, should be grown as a supplementary source of income.

Hermitage-Talbott-Colbert soil association

Like those of the Allen-Jefferson association, the soils of the Hermitage-Talbott-Colbert association occupy positions on gentle valley slopes adjacent to steep stony mountain areas. They usually lie in strips at the base of these steep slopes and are widely distributed throughout the eastern half of the county. They cover about 7 percent of the total area.

These soils are distinguished from the Allen-Jefferson soils mainly by a finer, heavier texture and shallower depth to heavy plastic material and limestone bedrock. Although drainage is generally favorable for crops, the soils are more slowly permeable to roots and moisture than the predominant soils in the Allen-Jefferson soil association. They are somewhat more fertile, however, than the Allen-Jefferson soils and are better suited to grasses. The association consists mainly of soils fair to good for the agriculture of the area.

Most of these soils have been cleared and are now cropped or pastured. General farming predominates;

fair to good for pasture. Soils not well suited to tilled crops but fair for pasture are confined to the less extensive poorly drained areas and to those that are the most severely eroded and steeply sloping. Most of this association is in the northeastern quarter of the county. There is a notable acreage of some of its component soils, such as the Dewey, in other parts of the county. In these other parts they are in combination with other soils that give a different soil association.

Much of the acreage has been cleared and is now cropped or pastured. Cotton farms predominate; many of the farms are tenant operated. Row crops, especially cotton, receive moderately heavy applications of fertilizer. A considerable acreage of these soils, such as of the rolling phases, has been damaged considerably by erosion, and broken rock debris lie on the slopes that are underlain by limestone, especially along the upper edge. This debris has worked down from the adjacent higher slopes.

Practically all of the soils of this association are under cutover native deciduous forest. Because the land is so steep and stony, it is practically all unsuitable for crops or pasture. It will produce forest, but a large part is not easily accessible for this purpose.

Irrigation

In recent years irrigation has become increasingly important in this county. Several factors are responsible; the cost of overhead irrigation has decreased greatly;

necessary great care to maintain optimum moisture and plant-nutrient balance.

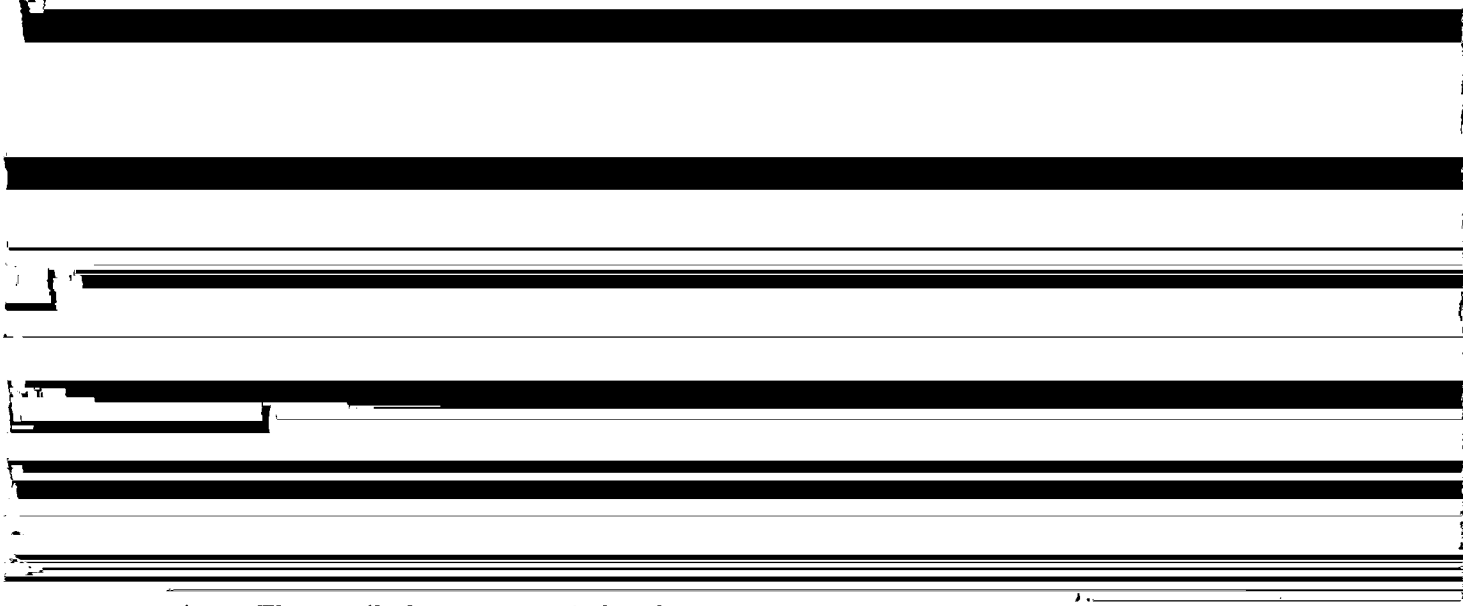
The drainage in the soils of group 6 is somewhat impaired; most of these soils are low in plant nutrients. Only under unusual circumstances and with heavy fertilization can good response be expected from irrigation.

The content of clay is high in the soils of groups 7 and 8, and many of these soils are shallow to bedrock. Maintaining optimum moisture and good tilth is considerably more difficult than in the more friable loamy soils.

The surface of most of the soils in groups 9, 10, and 12 is rolling. This rolling surface makes it difficult to move equipment and to carry on other field work. In addition, if water is applied in excessive amounts, it is more likely

In many years yields of alfalfa hay will increase considerably if irrigation is used, because alfalfa needs considerable moisture during the driest part of the growing season. Late-season crops, such as corn and soybeans, will respond to irrigation in years when moisture is not sufficient during midsummer and late summer. Often irrigation of fall-sown small grains and other winter cover crops, such as crimson clover, is of considerable advantage. It gets the crops off to an early start and helps to establish a uniform stand.

You should get the help of an experienced engineer or soil conservationist before you decide to install an irrigation system on your farm.



to cause erosion. These soils have more of the clayey subsoil exposed. As a result, the plow layer has less favorable tilth and a lower capacity for holding moisture available to plants. Under good management, however, if additional moisture is needed, these soils should respond well to irrigation.

Much of the Hamblen, Lindside, and Ooltewah acreage retains moisture longer during dry periods than the higher, better drained soils of the uplands and therefore will not respond so well to irrigation. This is true to some degree also of the other soils in group 1 and those of group 3. The low position of these soils makes moisture somewhat more favorable than in the upland soils.

Irrigation is of greater value to some crops than to others. High-value crops, such as potatoes, beans, and strawberries, give a high return if water is applied during a drought that occurs at a critical stage in their development. Pasture in some years will benefit greatly from irrigation, both in yield and in palatability. All pasture plants, however, are not equally responsive. Bermudagrass and bluegrass are among those that are not so responsive; orchardgrass, whiteclover, lespedeza, fescue, and Dallisgrass are among the most responsive.

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Soil	Map symbol	Management group [1]	Slope range	Natural drainage [2]	Permeability
			Percent		
Abernathy silt loam	Ad	1	0– 2	Good	Moderately rapid
Abernathy cherty silt loam	Ab	1	0– 2	Good	Moderately rapid
Abernathy fine sandy loam	Ac	1	0– 2	Good	Moderately rapid
Allen fine sandy loam, undulating phase	Am	4	2– 6	Good	Moderately rapid
Allen fine sandy loam, eroded undulating phase	An	4	2– 6	Good	Moderately rapid
Allen fine sandy loam, eroded rolling phase	Ao	11	6–12	Good	Moderately rapid
Allen clay loam, severely eroded rolling phase	Al	12	6–12	Good	Moderately rapid
Allen stony fine sandy loam, eroded undulating phase	Ap	4	2– 6	Good	Moderately rapid
Allen stony fine sandy loam, eroded rolling phase	Ar	11	6–12	Good	Moderately rapid
Allen stony fine sandy loam, eroded hilly phase	As	13	12–20	Good	Moderately rapid
Baxter cherty silt loam, undulating phase	Ba	3a	2– 6	Good	Moderate
Baxter cherty silt loam, eroded undulating phase	Bb	3a	2– 6	Good	Moderate
Baxter cherty silty clay loam, severely eroded undulating phase.	Bg	12	2– 6	Good	Moderate
Baxter cherty silt loam, rolling phase	Bc	9	6–12	Good	Moderate
Baxter cherty silt loam, eroded rolling phase	Bd	9	6–12	Good	Moderate
Baxter cherty silty clay loam, severely eroded rolling phase.	Bh	12	6–12	Good	Moderate to slow
Baxter cherty silt loam, hilly phase	Be	13	12–20	Good	Moderate
Baxter cherty silt loam, eroded hilly phase	Bf	13	12–20	Good	Moderate
Baxter cherty silty clay loam, severely eroded hilly phase.	Bk	13	12–20	Good	Slow
Bodine cherty silt loam, hilly phase	Bn	13	12–20	Somewhat excessive	Moderately rapid
Bodine cherty silt loam, eroded hilly phase	Bo	13	12–20	Somewhat excessive	Moderately rapid
Bodine cherty silt loam, steep phase	Bp	15a	20–60	Somewhat excessive	Moderately rapid
Bruno loamy fine sand	Br	1a	0– 3	Excessive	Very rapid
Captina and Capshaw silt loams, undulating phases	Cc	5	2– 6	Moderately good	Moderately slow
Captina and Capshaw silt loams, level phases	Cb	5	0– 2	Moderately good	Moderately slow
Captina and Capshaw loams, undulating phases	Ca	5	2– 6	Moderately good	Moderately slow
Colbert silt loam, undulating phase	Ck	7	2– 6	Moderately good	Slow
Colbert silty clay loam, eroded undulating phase	Cl	7	2– 6	Moderately good	Slow
Colbert silty clay loam, eroded rolling phase	Cm	10	6–12	Good	Slow
Colbert silt loam, level phase	Ch	6	0– 2	Moderately good	Slow
Colbert cherty silt loam, undulating phase	Cd	7	2– 6	Moderately good	Slow
Colbert cherty silty clay loam, eroded undulating phase	Ce	7	2– 6	Moderately good	Slow
Colbert cherty silty clay loam, eroded rolling phase	Cf	10	6–12	Good	Slow
Colbert fine sandy loam, eroded undulating phase	Cg	7	2– 6	Moderately good	Slow
Cookeville silt loam, undulating phase	Co	3	2– 6	Good	Moderate
Cookeville silt loam, eroded undulating phase	Cp	3	2– 6	Good	Moderate
Cookeville silt loam, eroded rolling phase	Cr	8	6–12	Good	Moderate
Cumberland loam, undulating phase	Cu	3	2– 6	Good	Moderate
Cumberland loam, eroded undulating phase	Cv	3	2– 6	Good	Moderate
Cumberland loam, eroded rolling phase	Cw	8	6–12	Good	Moderate
Decatur and Cumberland silt loams, undulating phases	Db	3	2– 6	Good	Moderate
Decatur and Cumberland silty clay loams, eroded undulating phases.	Df	3	2– 6	Good	Moderate
Decatur and Cumberland silty clays, severely eroded undulating phases.	Dc	12	2– 6	Good	Moderate
Decatur and Cumberland silt loams, level phases	Da	3	0– 2	Good	Moderate
Decatur and Cumberland silty clay loams, eroded rolling phases.	Dg	8	6–12	Good	Moderate
Decatur and Cumberland silty clays, severely eroded rolling phases.	Dd	12	6–12	Good	Moderate

See footnotes at end of table.

showing the important characteristics of the soils

Surface soil color [3] [4]	Subsoil		Depth [5]	Parent rock or parent material
	Color [3]	Consistence [3]		
			Feet	
Brown to dark reddish brown.	Dark reddish brown to brownish red.	Friable	8+	Local alluvium originating from high-grade limestone.
Same	Same	Friable	8+	Local alluvium originating from high-grade cherty limestone.
Grayish brown to reddish brown.	Grayish brown to reddish brown.	Friable	8+	Local alluvium originating chiefly from high-grade limestone.
Same	Reddish brown to yellowish red.	Friable to firm	3– 8	Old mixed colluvium from sandstone, shale, and some limestone.
Reddish brown	Same	Friable to firm	2½– 8	Same.
Reddish brown	Same	Firm	2– 7	Same.
Reddish brown	Same	Friable to firm	1½– 6	Same.
Reddish brown	Same	Friable to firm	2½– 8	Same.
Reddish brown	Same	Friable to firm	2– 7	Same.
Reddish brown	Same	Friable to firm	1½– 6	Same.
Grayish brown	Yellowish red mottled in lower part.	Firm	2– 5	Cherty limestone.
Brownish yellow or reddish yellow.	Same	Firm	3– 5	Cherty limestone.
Yellowish red	Same	Very firm	3– 5	Cherty limestone.
Grayish brown	Same	Firm	2– 4	Cherty limestone.
Brownish yellow or reddish yellow.	Same	Firm	2– 4	Cherty limestone.
Yellowish red	Same	Firm	2– 4	Cherty limestone.
Grayish brown	Same	Firm	2– 4	Cherty limestone.
Brownish yellow to yellowish red.	Same	Firm	2– 4	Cherty limestone.
Yellowish red	Yellowish red mottled in lower part.	Firm	1– 3	Cherty limestone.
Pale brown to grayish brown	Brownish-yellow clayey cherty matrix.	Firm	1½– 3	Very cherty limestone.
Pale yellow	Same	Firm	1½– 3	Very cherty limestone.
Pale brown to grayish brown	Same	Firm	½– 2	Very cherty limestone.
Very pale brown to brownish yellow.	Pale yellow	Loose	6+	Young general alluvium chiefly from sandstone.
Pale yellow	Light yellowish brown to yellowish brown grading to mottled in lower part.	Friable to firm	4–15	Old general alluvium chiefly from limestone; some shale and sandstone.
Pale yellow	Same	Friable to firm	4–15	Same.
Pale yellow	Same	Friable to firm	4–15	Same.
Light yellowish brown	Brownish yellow grading to mottled.	Very firm	1½– 4	Clayey or argillaceous limestone.
Brownish yellow	Same	Very firm	1– 3	Same.
Brownish yellow	Same	Very firm	½– 2½	Same.
Gray to pale yellow	Yellow, faintly mottled	Very firm	2– 4	Same.
Light yellowish brown	Brownish yellow grading to mottled.	Very firm	2½– 5	Cherty clayey limestone.
Brownish yellow	Brownish yellow to yellowish brown.	Very firm	2– 4	Cherty clayey limestone.
Light yellowish brown	Brownish yellow grading to mottled.	Very firm	1½– 3½	Cherty clayey limestone.
Gray to pale yellow	Yellow grading to mottled	Very firm	2– 3½	Thin alluvium over clayey limestone residuum.
Pale brown	Yellowish red	Firm	5– 8	Cherty limestone.
Pale brown to brown	Yellowish red	Firm	5– 8	Cherty limestone.
Pale brown to reddish yellow.	Yellowish red	Firm	8–35	Cherty limestone.
Grayish brown to dark brown.	Dark reddish brown to dark red.	Moderately firm	4–20	Old general alluvium, chiefly limestone; some shale and sandstone.
Brownish red	Same	Firm	4–15	Same.
Brownish red	Same	Firm	4–15	Same.
Dark brown to dark reddish brown.	Same	Firm	5–20	High-grade limestone and old general alluvium chiefly from limestone.
Brownish red	Same	Firm to very firm	5–20	Same.
Dark reddish brown to red	Same	Same	3½–20	Same.
Dark brown to dark reddish brown.	Same	Firm	5–20	Same.
Brownish red	Same	Firm to very firm	4–16	Same.

Soil	Map symbol	Management group [1]	Slope range	Natural drainage [2]	Permeability
			Percent		
Decatur and Cumberland silty clays, gullied phases	DE	12	6–25	Good	Moderate
Dewey cherty silty clay loam, eroded undulating phase	DL	3a	2– 6	Good	Moderate
Dewey cherty silty clay, severely eroded undulating phase.	DH	12	2– 6	Good	Moderate
Dewey cherty silty clay loam, eroded rolling phase	DM	9	6–12	Good	Moderate
Dewey cherty silty clay, severely eroded rolling phase	DK	12	6–12	Good	Moderate
Dickson silt loam, undulating phase	DT	5	2– 6	Moderately good	Moderately slow
Dickson silt loam, eroded undulating phase	DU	5	2– 6	Moderately good	Moderately slow
Dickson silt loam, level phase	DS	5	0– 2	Moderately good	Moderately slow
Dickson cherty silt loam, undulating phase	DN	5	2– 6	Moderately good	Moderately slow
Dickson cherty silt loam, eroded undulating phase	DO	5	2– 6	Moderately good	Moderately slow
Dickson cherty silt loam, rolling phase	DP	9	6–12	Moderately good	Moderately slow
Dickson cherty silt loam, eroded rolling phase	DR	9	6–12	Moderately good	Moderately slow
Dowellton silt loam	DV	6	0– 3	Poor	Very slow
Dunning silty clay	DW	14	0– 2	Poor	Very slow
Egam silty clay loam	EG	1	0– 2	Moderately good	Moderately slow
Ennis silt loam	EN	1	0– 2	Good	Moderately rapid
Etowah silt loam, undulating phase	EX	2	2– 6	Good	Moderately rapid
Etowah silty clay loam, eroded undulating phase	EY	2	2– 6	Good	Moderately rapid
Etowah silt loam, level phase	EW	2	0– 2	Good	Moderately rapid
Etowah silty clay loam, eroded rolling phase	EZ	8	6–12	Good	Moderately rapid
Etowah cherty silt loam, undulating phase	ES	3a	0– 6	Good	Moderately rapid
Etowah loam, undulating phase	EU	2	2– 6	Good	Moderately rapid
Etowah loam, eroded undulating phase	EV	2	2– 6	Good	Moderately rapid
Etowah loam, level phase	ET	2	0– 2	Good	Moderately rapid
Greendale silt loam	GS	2	0– 5	Good	Moderately rapid
Greendale cherty silt loam	GR	2	0– 5	Good	Moderately rapid
Guthrie silt loam	GU	14	0– 2	Poor	Very slow
Hamblen fine sandy loam	HA	1	0– 2	Somewhat poor	Moderately rapid
Hartsells fine sandy loam, undulating phase	HB	4	2– 5	Good	Moderately rapid
Hartsells fine sandy loam, eroded undulating phase	HC	4	2– 5	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, rolling phase	HF	11	5–10	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, eroded rolling phase	HG	11	5–10	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, undulating shallow phase	HD	4	2– 5	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, eroded undulating shallow phase.	HE	4	2– 5	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, rolling shallow phase	HH	11	5–10	Somewhat excessive	Moderately rapid
Hartsells fine sandy loam, eroded rolling shallow phase	HI	11	5–10	Somewhat excessive	Moderately rapid
Hermitage silt loam, undulating phase	HO	3	2– 6	Good	Moderate
Hermitage silt loam, eroded undulating phase	HP	3	2– 6	Good	Moderate
Hermitage silt loam, eroded rolling phase	HQ	8	6–12	Good	Moderate
Hermitage cherty silt loam, eroded undulating phase	HJ	3a	2– 6	Good	Moderate
Hermitage cherty silt loam, rolling phase	HK	9	6–12	Good	Moderate
Hermitage cherty silt loam, eroded rolling phase	HL	9	6–12	Good	Moderate
Hermitage cherty silty clay loam, severely eroded rolling phase.	HN	12	6–12	Good	Slow
Hermitage cherty silt loam, eroded hilly phase	HM	13	12–25	Good	Moderate

See footnotes at end of table.

the important characteristics of the soils—Continued

Subsoil				
Color [3]		Consistence [3]		
			Feet	
Same	Same	Firm to very firm	3–14	Same.
Brown to reddish brown	Yellowish red to brownish red.	Firm	8–20	High-grade cherty limestone.
Yellowish red to brownish red.	Mottled yellowish red to brownish red.	Firm	7–18	Same.
Brown to reddish brown	Yellowish red to brownish red.	Firm	7–18	Same.
Yellowish red to brownish red.	Same	Firm	6–15	Same.
Light brownish gray to yellowish brown.	Yellowish brown grading to mottled.	Friable to moderately firm.	5– 8	Cherty limestone.
Light yellowish brown	Yellowish brown to brownish yellow.	Friable to moderately firm.	5– 8	Cherty limestone.
Light brownish gray to yellowish brown.	Same	Friable to moderately firm.	5– 8	Cherty limestone.
Same	Same	Friable to moderately firm.	4– 6	Cherty limestone.
Light brownish gray to light yellowish brown.	Same	Friable to moderately firm.	4– 6	Cherty limestone.
Light brownish gray	Same	Friable to moderately firm.	3– 6	Cherty limestone.
Light yellowish brown	Same	Friable to moderately firm.	3– 6	Cherty limestone.
Grayish brown	Gray, mottled	Extremely firm	3– 7	Clayey limestone.
Very dark grayish brown, faintly mottled.	Very dark gray or dark olive gray, mottled.	Very firm	5+	General alluvium from clayey limestone.
Dark brown to very dark grayish brown.	Dark yellowish brown	Same	6+	Mixed general alluvium chiefly from limestone.
Dark yellowish brown	Brown to dark yellowish brown.	Friable	3½–10	Mixed general alluvium chiefly from cherty limestone.
Brown to reddish brown	Yellowish red	Friable but firm	4–20	Mixed general alluvium, chiefly limestone.
Brown	Yellowish red	Firm	4–20	Same.
Brown to yellowish brown	Brown to dark yellowish brown.	Firm but friable	4–20	Same.
Yellowish brown	Yellowish brown to yellowish red.	Firm	3–18	Same.
Brown to reddish brown	Yellowish red	Moderately firm	4–20	Mixed general alluvium, chiefly limestone.
Grayish brown or brown	Yellowish red to reddish brown.	Firm but moderately friable.	4–20	Same.
Same	Yellowish red	Firm	4–20	Same.
Grayish brown	Yellowish brown	Firm	4–20	Same.

Soil	Map symbol	Management group [1]	Slope range	Natural drainage [2]	Permeability
			Percent		
Hollywood silty clay	HR	6	0– 2	Somewhat poor	Very slow
Hollywood silty clay, eroded undulating phase	HS	6	2– 4	Somewhat poor	Very slow
Holston fine sandy loam, undulating phase	HU	4	2– 6	Moderate	Moderate
Holston fine sandy loam, eroded undulating phase	HV	4	2– 6	Good	Moderate
Holston fine sandy loam, level phase	HT	4	0– 2	Good	Moderate
Humphreys silt loam	HX	2	0– 6	Moderately good	Moderately rapid
Humphreys cherty silt loam	HW	2	0– 6	Moderate	Moderately rapid
Huntington silt loam	HZ	1	0– 4	Good	Moderate
Huntington fine sandy loam	HY	1	0– 2	Somewhat excessive	Moderately rapid
Jefferson fine sandy loam, undulating phase	JE	4	2– 6	Good	Moderately rapid
Jefferson fine sandy loam, eroded undulating phase	JF	4	2– 6	Good	Moderately rapid
Jefferson fine sandy loam, eroded rolling phase	JG	11	6–12	Good	Moderately rapid
Jefferson stony fine sandy loam, eroded rolling phase	JH	11	6–12	Good	Moderately rapid
Lawrence silt loam	LA	6	0– 2	Somewhat poor	Slow
Lee silt loam	LE	14	0– 2	Poor	Moderately slow
Lee-Lobelville silt loams	LG	14	0– 2	Poor to somewhat poor	Moderately slow
Lee-Lobelville cherty silt loams	LF	14	0– 2	Same	Moderately slow
Lickdale silt loam	LH	14	0– 2	Poor	Moderately slow
Lindside silty clay loam	LK	1	0– 2	Somewhat poor	Moderate
Linker fine sandy loam, eroded undulating phase	LL	4	2– 5	Somewhat excessive	Moderately rapid
Made land		15a	2–12		
Melvin silty clay loam	ME	14	0– 2	Poor	Slow
Monongahela fine sandy loam	MO	6	0– 4	Somewhat poor	Slow
Muskingum fine sandy loam, hilly phase	MU	13	10–20	Somewhat excessive	Rapid
Muskingum stony fine sandy loam, hilly phase	MV	15a	10–20	Somewhat excessive	Rapid
Muskingum stony fine sandy loam, steep phase	MW	15a	20–45	Somewhat excessive	Rapid
Ooltewah silt loam	OP	1	0– 2	Somewhat poor	Moderate
Ooltewah fine sandy loam	OO	1	0– 2	Somewhat poor	Moderate
Pearman loam	PA	7	2– 5	Moderately good	Slow
Pits, clay	PC	15a			
Pits, gravel	PG	15a			
Prader fine sandy loam	PR	14	0– 2	Poor	Slow
Robertsville silt loam	RO	14	0– 2	Poor	Very slow
Rockland, limestone, steep	RS	15a	25+		
Rockland, limestone, hilly	RR	15a	12–25		
Rockland, limestone, rolling	RP	15a	2–12		
Sequatchie fine sandy loam	SE	2	0– 6	Good	Rapid
Sequatchie fine sandy loam, eroded phase	SF	2	2– 6	Good	Rapid
Stony colluvium, Jefferson and Colbert soil materials	ST	15	0– 3	Excessive	Very rapid

the important characteristics of the soils—Continued

Surface soil color [3] [4]	Subsoil		Depth [5]	Parent rock or parent material
	Color [3]	Consistence [3]		
			Feet	
Dark grayish brown	Olive tinted very dark gray	Very firm	1– 5	Local alluvium from clayey limestone.
Dark grayish brown	Very dark gray, mottled in lower part.	Very firm	½– 4	Same.
Light yellowish brown	Yellowish brown to yellow	Firm	3–15	Old general alluvium from sandstone and shale; some limestone.
Light yellowish brown	Yellowish brown, mottled in lower part.	Firm	3–15	Same.
Pale brown or light brownish gray.	Yellowish brown to yellow	Firm	3–15	Same.
Yellowish brown	Dark yellowish brown	Moderately firm	4–20	Old general alluvium from cherty limestone.
Dark grayish brown to yellowish brown.	Dark yellowish brown, somewhat mottled.	Moderately firm	4–20	Same.
Dark brown to dark yellowish brown.	Same	Friable	5+	Young general alluvium chiefly from high-grade limestone.
Grayish brown to dark yellowish brown.	Yellowish brown to dark yellowish brown.	Moderately firm but friable.	5+	Young general alluvium from limestone, sandstone, and shale.
Pale brown	Yellowish brown	Friable to firm	3– 8	Old mixed colluvium from sandstone, shale, and limestone.
Brownish yellow	Yellowish brown	Moderately firm but friable.	3– 8	Same.
Brownish yellow	Yellowish brown	Moderately firm but friable.	2– 7	Same.
Brownish yellow	Yellowish brown	Moderately firm but friable.	2– 7	Same.
Light yellowish brown to pale brown.	Brownish yellow, mottled	Firm	15–40	Cherty limestone.
Grayish brown	Light gray, mottled	Friable	5+	Young general alluvium from cherty limestone.
Grayish brown to light brownish gray.	Mottled brownish gray, brownish yellow, yellowish brown, or yellowish red.	Friable	5+	Same.
Light brownish gray to grayish brown, faintly mottled.	Same	Friable to firm	5+	Same.
Dark grayish brown	Dark gray, faintly mottled	Friable	1½– 3	Sandstone, partly local alluvium.
Dark brown or dark grayish brown.	Mottled brown	Moderately firm	5+	Young general alluvium chiefly from high-grade limestone.
Grayish brown to light reddish brown.	Yellowish red	Friable to firm	3– 6	Sandstone and conglomerate residuum.
Grayish brown to dark grayish brown.	Light gray, mottled	Moderately friable	5+	Young general alluvium from high-grade limestone.
Light yellowish brown	Light yellowish brown to mottled.	Firm	4–15	Old general alluvium from sandstone, shale, and limestone mixed.
Grayish brown to light yellowish brown.	Light yellowish brown	Friable	1– 3	Sandstone.
Same	Light yellowish brown	Friable	0– 2½	Sandstone.
Same	Light yellowish brown	Friable	0– 2	Sandstone.
Brown to reddish brown	Brown, mottled	Friable	6+	Young local alluvium from limestone.
Grayish brown to reddish brown.	Brown, mottled	Friable	6+	Young local alluvium chiefly from limestone.
Light yellowish brown	Mottled yellowish brown	Very firm	2½– 4	Sandstone, shale, and limestone.
Pale brown	Gray, mottled with yellow, reddish yellow, and brown.	Friable to firm	4–20	Young mixed general alluvium from sandstone, limestone, and shale.
Grayish brown to light grayish brown.	Gray, mottled	Very firm	4–20	Old general alluvium chiefly from limestone.
			0– 1	Limestone.
			0– 1	Limestone.
			0– 1	Limestone.
Grayish brown	Yellowish red to reddish brown.	Friable to firm	5–20	Moderately old general alluvium, chiefly from sandstone.
Grayish brown	Same	Friable to firm	4–20	Same.
Grayish brown	Brownish yellow	Friable	3–10	Young colluvium, chiefly from sandstone, and local alluvium.
Pale yellow or yellowish brown to reddish yellow.	Yellowish brown to yellowish red grading to mottled.	Very firm	0– 2	Clayey limestone.
Same	Same	Very firm	0– 2	Clayey limestone.
Grayish brown	Light yellowish brown	Friable	0– 1½	Sandstone.

Soil	Map symbol	Management group [1]	Slope range	Natural drainage [2]	Permeability
			Percent		
Taft silt loam	TA	6	0–2	Somewhat poor	Slow
Talbott silty clay loam, eroded undulating phase	TG	7	2–6	Moderately good	Slow
Talbott silty clay loam, eroded rolling phase	TH	10	6–12	Moderately good	Slow
Talbott cherty silty clay loam, eroded undulating phase	TB	7	2–6	Moderately good	Slow
Talbott cherty silty clay loam, eroded rolling phase	TC	10	6–12	Moderately good	Slow
Talbott cherty silty clay, severely eroded rolling phase	TD	12	6–12	Moderately good	Slow
Talbott fine sandy loam, eroded undulating phase	TE	7	2–6	Moderately good	Slow
Talbott fine sandy loam, eroded rolling phase	TF	10	6–12	Moderately good	Slow
Talbott-Colbert cherty silty clay loams, eroded hilly phases.	TK	13	12–25	Moderately good	Slow
Tupelo silt loam	TU	6	0–2	Somewhat poor	Slow
Tupelo silt loam, overwash phase	TV	6	0–2	Somewhat poor	Slow
Tyler very fine sandy loam	TY	14	0–2	Poor	Very slow
Wolftever silt loam	WO	2	0–4	Moderately good	Moderately slow
Wolftever silt loam, eroded phase	WP	2	2–4	Moderately good	Moderately slow

[1] Groups discussed in the section on Use and Management of Soils.
[2] Equivalent to drainage classes in Soil Survey Manual (7).
[3] Moderately moist.
[4] Applies to the 5- or 6-inch plow layer in the eroded and severely eroded phases.
[5] Depth to bedrock or to distinctly different material such as a bed of gravel.

the important characteristics of the soils—Continued

Surface soil color [3 4]	Subsoil		Depth [5]	Parent rock or parent material
	Color [3]	Consistence [3]		
			Feet	
Light yellowish brown	Brownish yellow, mottled	Friable to firm	4–20	Old general alluvium chiefly from limestone.
Brown to light reddish brown.	Yellowish red	Very firm	2– 6	Clayey limestone.
Yellowish red to reddish brown.	Reddish brown	Very firm	1½– 5	Clayey limestone.
Pale brown to light reddish brown.	Reddish brown to reddish yellow.	Very firm	2– 6	Cherty clayey limestone.
Reddish brown	Yellowish red	Very firm	1½– 5	Cherty clayey limestone.
Yellowish red to reddish brown.	Yellowish red to reddish brown, mottled.	Very firm	1– 4	Cherty clayey limestone.
Light brown to light reddish brown.	Yellowish red grading to mottled.	Very firm	2– 6	Thin alluvium over clayey limestone residuum.
Same	Same	Very firm	1½– 5	Same.
Yellowish red to yellowish brown.	Yellowish red, reddish brown, or yellowish brown.	Very firm	½– 3	Cherty clayey limestone.